THE JOURNAL OF GAS LIGHTING
WATER SUPPLY & SANITARY IMPROVEMENT

VOL. LIV. No. 1373.] LONDON, SEPTEMBER 3, 1889. [41ST YEAR. Price 6d.

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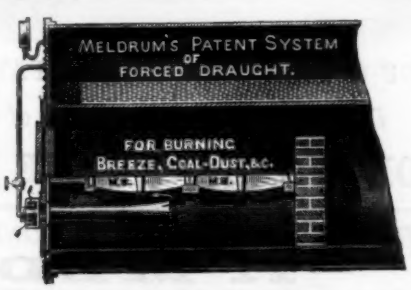

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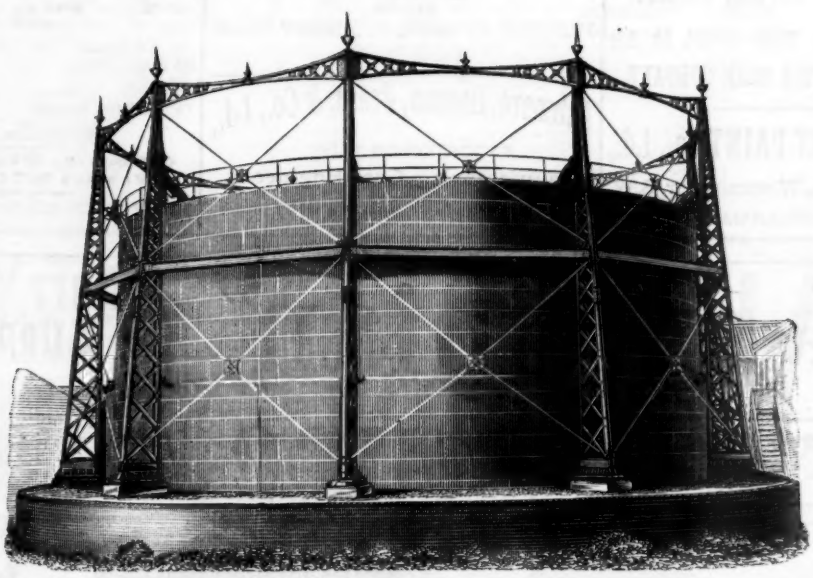

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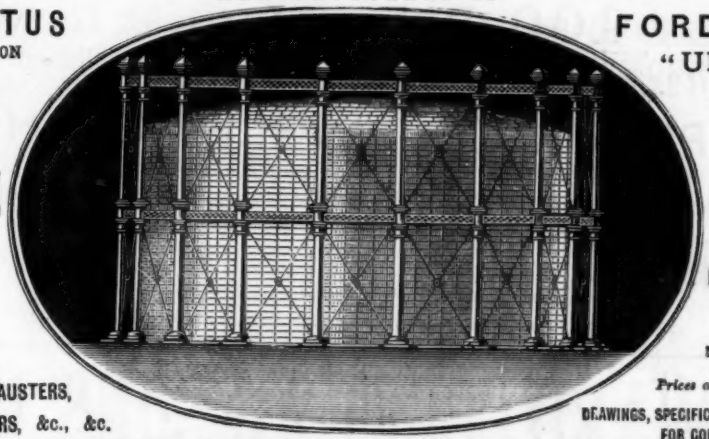

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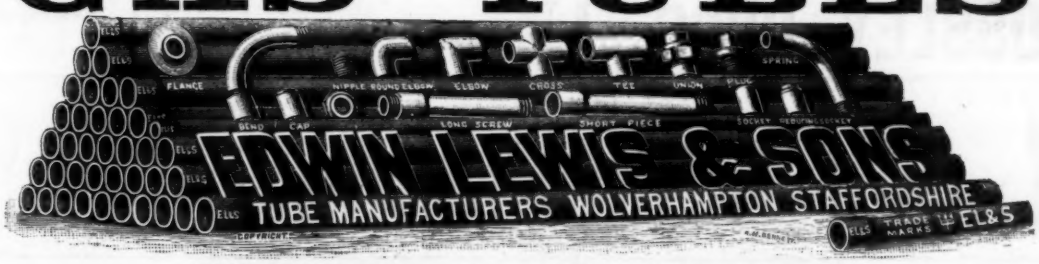

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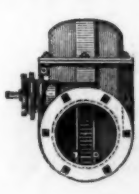

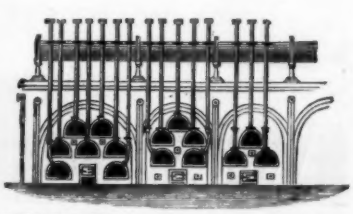

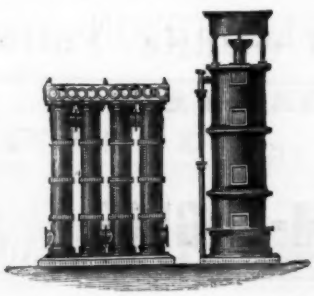

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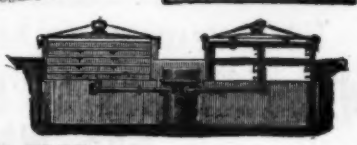

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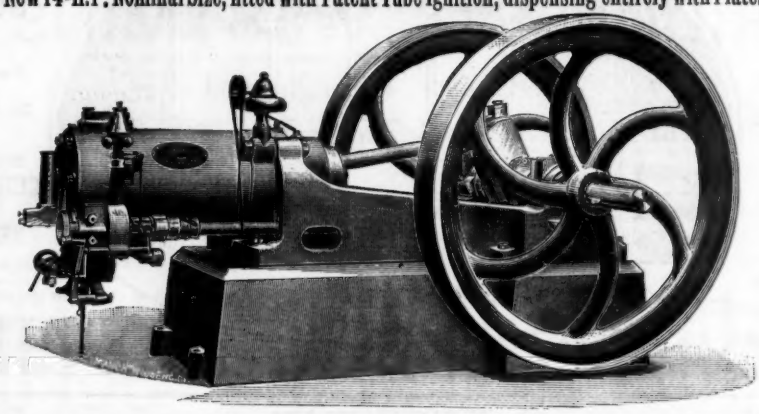
New 14-H.P. Nominal Size, fitted with Patent Tube Ignition, dispensing entirely with Plates.



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DRIVEN FROM
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The Pumps are provided with suitable Valves for pumping Ammoniacal Liquor, Tar, and Water; and each is provided with Disengaging Gear, in order that any one can be stopped or started while the Engine is in motion.

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Hitchin Gas Company.
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A very large amount of patronage has been accorded the "Standard" Washer-Scrubber, of which, up till now, **367** have been supplied, representing a daily make of **318,260,000** cubic feet of gas; but the advantages of the **"New Standard"** will be readily recognized, and its superiority over the present "Standard" may be briefly summarized as follows:—

1. The weight in motion is **only one-seventh** of that in the present machine.
2. It requires **only one-seventh** the power to drive; consequently effecting a large reduction in cost of Engine as well as in steam power.
3. **The Wear and Tear is enormously reduced,** as the Shaft has comparatively little weight to carry.
4. It has been found that the washing surfaces **keep perfectly clean** and free from deposit from end to end of the Machine.
5. It is so constructed that it forms a most powerful, effective, and complete system of purification, gives no pressure, and can be removed and replaced without trouble or injury.
6. The "New Standard," owing to the foregoing, can be supplied at **a large reduction in price.**

Engineers desirous of working Ammoniacal Liquor over and over again prior to leaving the "New Standard" can do so by the automatic and simple arrangement which forms part of this Patent.

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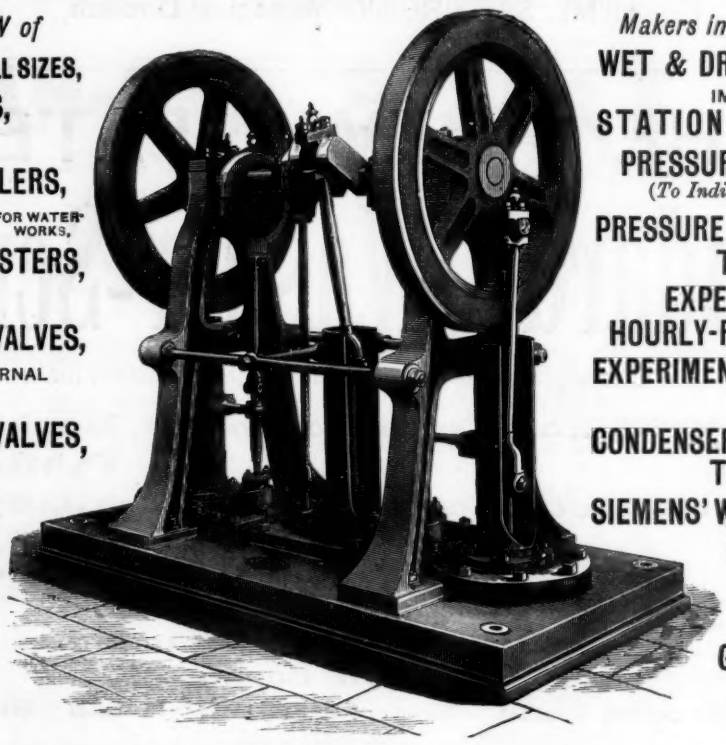

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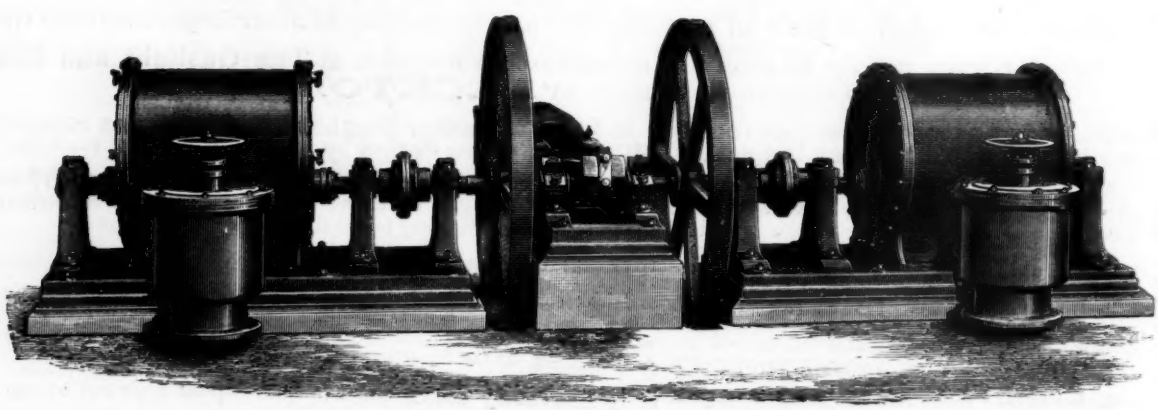

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AND FOR USE IN

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As supplied to several of the principal Gas-Works.

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SOLE MAKERS.

As supplied to several of the principal Gas-Works.

Hand Gear.

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(*From Photos of the ¾ cwt. size.*)

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"*Since the appearance of our* ['*The Engineer*'] *notice, the Hammer has been in some respects re-modelled, and its remarkable economy placed altogether beyond a doubt. . . . The Hammer described is that known as the ¾ cwt. size, and has a cylinder of 7 in. diameter and 6½ in. stroke. The maximum blow is very nearly that which would be given by* **a weight of 3 cwt. falling through a height of 1 ft.**; *and this can be repeated at the rate of* **110** *blows per minute. . . . Extended test in practical smith work has demonstrated that over* **2500 of the heavier blows** *referred to above, can be given with* **one pennyworth of gas** *at half-a-crown per* 1000 *feet—i.e., the Birmingham price to small consumers—or over* 4500 *varying blows for the same consumption.*"—"**The Engineer,**" **Sept. 10, 1886.**

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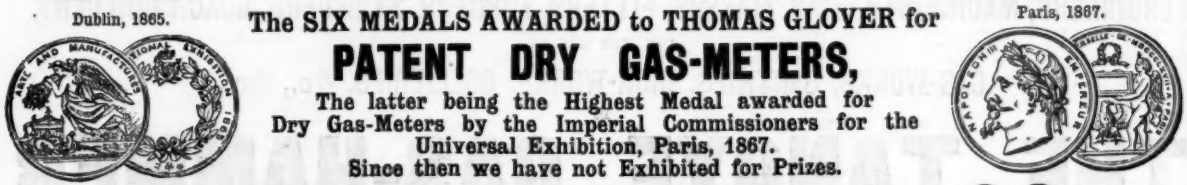

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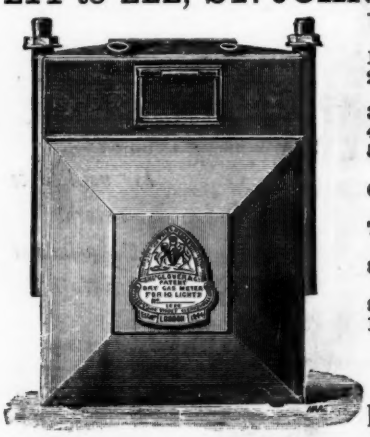

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Meters fitted with Grey's Index or Harding's Counter.

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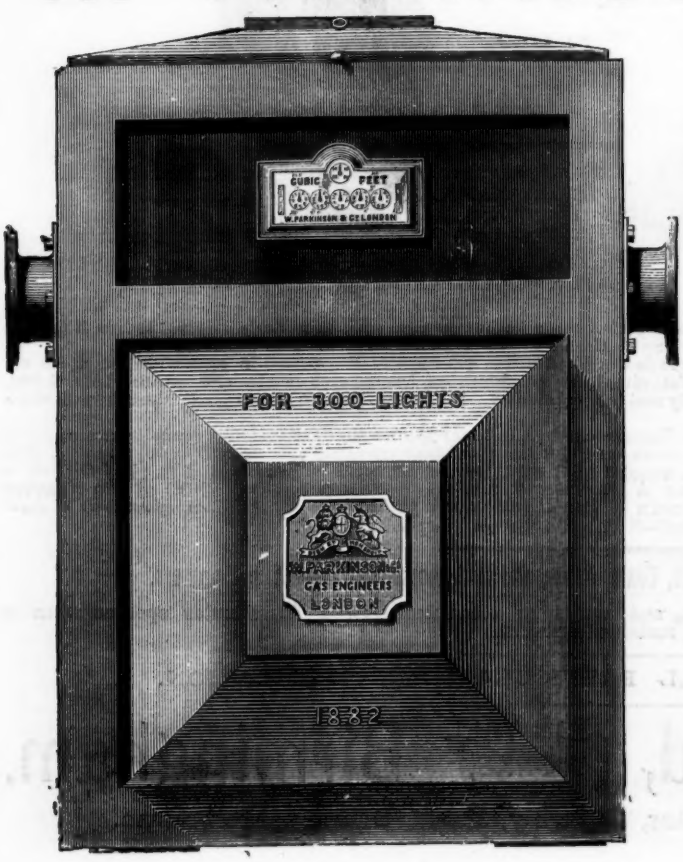

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With PATENT THREE-PARTITION DRUMS.

STATION METERS & GOVERNORS,

PRESSURE & EXHAUST REGISTERS.

MOTIVE POWER METERS,

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TO ADVERTISERS.

ADVERTISEMENTS for the next number of the JOURNAL must be received by Monday, 12 o'clock noon, to ensure insertion; but as the Advertisement sheet of the JOURNAL is sent to Press the first thing on Monday Morning, Advertisers will please bear in mind that Orders for Alterations in or Stoppages of PERMANENT Advertisements should be received Not Later than Two o'clock on SATURDAYS.

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THE JOURNAL OF GAS LIGHTING,
WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, SEPTEMBER 3, 1889.

THE DOCK LABOURERS' STRIKE.

THE great strike of the London dock labourers and porters continues to be the most engrossing topic of the hour. It is impossible to say at the time of writing what may be the condition of affairs when these lines meet the eyes of our readers; but if there is any material change in the general situation even at the last moment, before we go to press this week, intimation of the fact will be made in an additional paragraph. At present all that can be said is that the men are firm in their claim for higher pay, and better terms in regard to the conditions of their work; and although the Dock Companies have expressed their willingness to concede the latter demand, they have not shown any inclination to yield the former, which is in point of fact the principal one. A good deal has been stated in the newspapers respecting the possible effects of the strike upon the gas supply of London; and it is obvious that a great uprising amongst the day labourers of any centre of population must, more or less, affect the organization for gas supply. At the same time, as we stated last week, the London Gas Companies are not quite so helpless as some people would make them appear. Their own retort hands are not directly concerned in the movement of the dock labourers; and there is such a thing as the law relating to conspiracy, which would prove a sufficient preventive of anything like concerted action among the men to put London in darkness, with the object of bringing pressure to bear on the employers of certain classes of labour. The wild talk of some demagogues about calling on all wage-earners in the Metropolis to stop work, with a view to coerce the Dock Companies, is not likely to have much effect where the men are properly paid and fairly treated, although, of course, it is to be expected that some will take advantage of the opportunity to get better terms for themselves. The dock labourers' difficulty is one to be settled by the employers and the men directly concerned; and we are not at all disposed to interfere in the matter even to the extent of prophesying how it is likely to end. At the same time, there are a few considerations connected with the subject which may be stated here, as they have not been discussed elsewhere.

When a casual spectator sees the work of such a port as London proceeding with the normal display of regulated activity, he is apt to regard it as part of the natural order of things, and to be oblivious of the nice adjustment of labour to wage that underlies all this multifarious industry. That most mysterious thing called "the state of trade" continually fluctuates however, apparently with as little respect for man's convenience as the weather; and accordingly the value of labour in different centres changes. Recently it has been recognised that trade has been improving; and merchants and manufacturers and transport agencies no sooner discovered the fact than wage-earners also perceived it, and took steps to turn it to their own advantage. Coal miners, seamen, stokers—in fact, many classes of labourers which it is unnecessary to specify—succeeded, after more or less of a struggle, in obtaining some higher rate of pay. Consequently, there is nothing at all extraordinary in the spread of a feeling of dissatisfaction among dock labourers and porters, although every strike, when it comes, is a surprise to all but the strikers. Many people, of the order of mind that is disposed to see the highest wisdom in the adage which declares that "half a loaf is better than no bread," are never prepared for the actions of the uncompromising spirits who hold any sacrifice cheap whereby they are enabled to gain a point. There is very little of the spirit of compromise in the modern workman. He is more ready to pursue the bitter logic of the counsel that bids him stand out for "all or nothing" at whatever cost. There may be few principles, as some would declare, in the workmen's code; but these he is usually willing to stand by in a fashion that fills more pliable intelligences with amazement.

It is possible that when the dock labourers' strike terminates, it may prove to have been the inauguration of a better state of things for the class of workers concerned, not only in London, but also in other parts of the country. The docks and wharves of London are, and have long been, the last resource of the able-bodied destitute. What volumes of descriptions have been written during the past few years about the work at the docks. Hither came the discharged soldier, the stranded sailor, the released convict, the shiftless man of every origin; and it has been the boast of the dock companies that they asked no questions, but gave employment (when they had it to give) to any man in need of it. This is doubtless a good thing in one sense; for in a place like London, there will always be multitudes of men to whom a casual day's work, obtainable without reference to character or antecedents, is a boon. Looked at from another point of view, however, the system has grave drawbacks. It attracts a vast floating population which cannot shake off the taint of vagabondage that uncertain, irresponsible daily employment soon brings upon them. The possibilities of obtaining work at the docks unsettle many men who might otherwise yield in time to the influences of regular, disciplined employment; and the hope of getting a few days' work now and then keeps other men hanging round the dock-gates who had far better accept the conclusion that they have failed in London, and return to the places whence they came. An ample supply of labour is necessary for employers; but it is not to the advantage of any settled and regular industry that labourers should be corrupted by the

casual, irresponsible, hand-to-mouth system of employment hitherto pursued by the managers of the London docks. Whether any radical improvement is possible in this connection, we cannot presume to say.

Gas companies necessarily employ a good deal of casual labour; but it is to be hoped and believed that gas managers do their utmost to prevent the uncertainty of some of their work from becoming so much of the nature of a lottery for the men intermittently engaged as to increase the shiftlessness which is such a prominent characteristic of the whole class of lumpers, "coaleys," trimmers, and 'longshore men generally. These men would prefer to earn their whole week's money in three or four days' heart-breaking toil, so that they might loaf the rest of the time. No matter how much money they may earn in one week, when the next job comes to be done, they are round the gates in a starving condition, and want a "sub" before they can get a bit of breakfast. Every gas manager knows this class of men; and very handy they are upon occasion. It is desirable, however, to seize upon every available means for inducing these poor waifs and strays of civilization to take to more settled employment; and this not wholly upon philanthropic grounds, but equally as a measure of industrial policy. They are at times a dangerous class of the community which in any case has to take care of them when sick, to maintain their families when they are "in trouble," and to keep them when past work. The fewer of this variety of labourers there are about a town, the more orderly is it likely to be; and when labour disputes arise, the less danger will attend their discussion and settlement. Again, we confess that it is not possible to specify in general terms how this process of improving the "lumper" is to be carried out. Circumstances must dictate measures. Suffice it for us to point out the object to be attained; the procedure must be in the discretion of those who have to deal at first hand with the problem.

On Friday last the state of affairs at the Beckton Gas-Works was somewhat critical. With three weeks' store of coal outside the retort-houses, there was only five days' supply on the stages inside; and the "coaleys" who should have transferred the coal to the stages, were on "strike." On Saturday, the situation changed for the better. Protected by the police, the coal-men set to work and placed 2000 tons of coal on the stages, following this up by 800 tons more on Sunday. Yesterday morning they commenced discharging from the ships, three of which were emptied of their cargoes at Beckton pier in the course of the day—thus adding 5000 tons to the supply. Many ships were in the Thames laden with gas coal for the Company; but the strike of the lightermen prevented any discharge of cargoes except at the pier. Supposing the strike of the lightermen to be settled, an abundant quantity of coal was ready on board-ship to supply the Company's wants at its various stations approachable by the Thames or by canal.

SUCCESS OF THE RAMSGATE GAS POPULARIZATION EXPERIMENTS.

The letter from Mr. W. A. Valon respecting the success of his scheme for increasing the popularity of gas in Ramsgate, which appears in our "Correspondence" columns to-day, is a welcome testimony to the wisdom of a policy that has in various developments been warmly recommended by the Journal when occasion has served. It is more common to receive information of the beginnings than of the continuation of experiments of this nature; but Mr. Valon is endowed with a degree of candour which warrants his professional brethren in expecting that, when he has committed himself to an enterprise, he will not shrink from telling the result, whether favourable to his original views or the reverse. He is to be congratulated, together with the Corporation of Ramsgate, upon the present fruits of his plan for granting increased facilities for the consumption of gas in the borough. Unlike some other Local Authorities that could be named, the Ramsgate Corporation are not trammelled by anything of ironmonger worship; and they are reaping their reward. Not the least interesting part of Mr. Valon's letter is that in which he indicates, as one effect of the new system, the favour which is likely to be extended to a more frequent collection of gas-rental generally. We believe we are justified in stating that since this letter was written, the Gas Committee of Ramsgate have decided to put any of their consumers desiring it on the list for "short collection," which except in the case of small and shifting, or specially temporary accounts, will probably be monthly. Although, as has been recognised when this subject of extending the consumption of gas has been discussed, Ramsgate occupies a peculiar position as an old-fashioned pleasure resort, there are many places in the kingdom that might take it as an example of the benefits of the frequent collection of gas accounts, and of the supply of internal fittings upon easy terms.

THE EXAMINATIONS IN GAS MANUFACTURE.

Last week we gave the lists of successful competitors in the examination in "Gas Manufacture" held in May by the City and Guilds of London Institute, when out of 57 students who entered, 48 passed. This is a very high percentage of passes; and the obvious reflection on the announcement would be that either the average quality of the candidates must have been exceptionally good, or the papers must have been unusually easy. We this week publish the questions in both the ordinary and honours grades, from which our readers may form an opinion as to which interpretation of the facts is the more reasonable. Our own opinion is that both papers are remarkably fair. There is nothing in the "ordinary" paper that should appal any intelligent youth who has passed a few years in and about a gas-works, while the higher paper is neither too easy nor too specialized for a young engineer. Both sets of questions do credit to the Examiners who set them. It is anything but an easy task to prepare these papers, so as to keep clear as far as possible of matters of opinion, and yet produce a test for knowledge as distinguished from mere reading. We have always taken great interest in these examinations, which at present furnish the only standard of gas engineering training in the country. As we have often said before when commenting upon these examinations, it by no means follows that a successful candidate is otherwise qualified to take a post as gas manager; but where other qualifications exist, ability to answer the "posers" of the Examiners in "Gas Manufacture" is an admirable thing. It does not follow that ability to "floor" the honours paper is evidence of a good gas manager; but it is certainly true that a good gas manager should be able to rattle off sufficient answers to the questions without experiencing any difficulty in the task.

THE HUNTER COMPACT.

The Mayor of Salford convened a special meeting of the Salford Town Council on Wednesday last, for the consideration of the "Hunter Compact and Petition," as it is called, in order that public opinion, which has been so strongly stirred up in regard to this matter, might be appeased by the thorough discussion of the whole subject. It is to be hoped that the public are contented with the columns of reported talk in the Town Council with which they were presented by Thursday morning's newspapers; for this is the only satisfaction they are likely to get. In opening the proceedings of the special meeting, the Mayor complained bitterly of what he called the misrepresentations of the Press, which had prejudiced local opinion upon the subject before it had been properly brought before the Council. It would appear, however, that the Press was driven to take the matter up, by the peculiar way in which the first scent of it escaped at a meeting of one of the Corporation Committees. The subject did not reach the public ear through the proceedings of the Town Council in the ordinary way; and thus an air of mystery surrounded it from the first. The compact with Hunter was concluded, and the petition for a remission of his sentence was signed secretly; and if this circumstance was afterwards magnified to the disparagement of those members of the Corporation who were implicated in these proceedings, it is their own fault. The business of the special meeting was muddled throughout. It was a field day for Mr. J. G. Mandley, who sadly mismanaged his opportunity; and the discussion narrowed down into a wrangle over the propriety of the action of certain members of the Corporation in signing the Hunter petition in their private capacity, and on a suggested petition for the appointment of a Royal Commission for investigating the frauds in connection with the management of the gas undertaking during the Hunter *régime*. What would have been the real interest of the proceedings was eliminated by the tacit admission of the majority that the action of the Consultative Committee in accepting the composition of £10,000 for staying the civil suits against Hunter and his companions must stand. The outcome of Wednesday's debate was the affirmation of what nobody will deny as an abstract principle—that "the personal rights and "privileges of municipal representatives are not fettered or "curtailed by becoming members of the corporate body of "any municipality;" and the carrying of a resolution against

asking for a Royal Commission, but authorizing the preparation of a memorial, praying the Government to pass an Act for the better prevention of bribery in connection with Corporation dealings. With this the people of Salford will have to be satisfied. Unless we are greatly mistaken public opinion will continue to condemn the compact, not so much out of animosity against Hunter personally, as from the conviction that the Corporation of Salford have fallen short of what was to have been expected of them as guardians of morality and law. The ratepayers may take up the matter, now that their official representatives have dropped it; but until they show signs of moving, we shall regard the incident as having terminated.

MR. ELLIS LEVER IN DEFEAT.

Mr. Ellis Lever last Friday made his appearance before the Magistrates sitting at the Manchester City Police Court, on the charge of libelling the members of the Gas Committee of the Manchester Corporation, and has got out of his trouble by making a full retraction and apology, and drawing a cheque for £300—one-half to be in payment of the costs of the prosecution, and the other half to go to the Manchester Hospital Fund. The Bench seemed to think this a rather easy let-off for such a man, and in regard to such a piece of business; but they somewhat contemptuously permitted the summonses to be withdrawn and the accused to retire. We have not heard that on this occasion there was any public reception, or brass-band "laid on" to meet Mr. Lever on his return to his home at Colwyn Bay, as on a notorious previous occasion. Indeed, to judge from the tone of certain local newspaper correspondence relating to the incidents of a chequered career as Apostle of Pure Dealing, some of Mr. Lever's friends are endeavouring to cover his retreat by referring to the past glories of the Hunter exposure. But there are not lacking those who hold that Mr. Lever's fondness for ascribing motives to people who decline to give him contracts for coals will receive a salutary check in this discomfiture before the Manchester Magistrates. We prefer not to enlarge upon the incident; but to let the record speak for itself. It was an unfortunate thing, in the interest of good gas administration in Manchester, when Mr. Lever went on the wrong tack in this matter. We are no admirers of the Manchester system of gas management, which we never hesitate to denounce in the most pointed language at our command. To hold that a policy is altogether mistaken and mischievous is, however, a totally different thing from believing that the men identified with it are corrupt and actuated by shameful motives. When grave personal imputations are made without reason upon men in responsible positions, and recoil upon their author, they attract sympathy for their objects; and it is probable that the members of the Manchester Gas Committee were never so favourably received by their fellow-citizens as they are to-day, as the result of Mr. Lever's *fiasco*. The cause of gas reform in Manchester has suffered a serious blow in this proceeding. We can congratulate the members of the Committee individually upon their deliverance from a ridiculous imputation upon their honour and credit, while frankly warning them that it will not make the slightest difference in our estimation of their official policy.

THE CONCENTRATION OF AMMONIACAL LIQUOR.

The attention of managers of small gas-works, remote from manufacturing centres, may be especially directed to the account of the apparatus of M. Chevalet for the concentration of ammoniacal liquor which appears in another part of the present issue of the Journal. Much has been done of late years to help them in converting their residual ammonia into the marketable form of sulphate; but without disparagement of the many real and economical patterns of small sulphate plants at present available, it may be said that there is yet plenty of room for the simple process of concentration worked out by M. Chevalet. So many inquiries have, in point of fact, been made concerning this apparatus since it was first noticed in our columns, that the fuller description now made public is certain to be welcomed in various outlying districts. The apparatus is not perhaps quite perfect; and it is easy to imagine a better way than that described in the paper for disposing of the uncondensable gases likely to create a nuisance. They might be absorbed in an oxide purifying box, for example; but this is a small point. Of course, any British gas-works adopting this system must be registered under the Alkali, &c., Works Act; but this is no great matter. The management of the plant, like its construction, is simplicity itself; and its advantages lie upon the surface. The requirement of light casks could be met by the employment of metallic drums, obtainable everywhere at a moderate cost, and practically indestructible if properly prepared for their peculiar purpose. Of course, when sulphate can be profitably made, there would be no benefit from the adoption of this system of treating the liquor; but it has an obvious field of its own without interfering with more perfect methods.

Water and Sanitary Affairs.

Considerable interest is being excited in what is called the "Amines" process for the treatment of sewage. The inventor of this system is Mr. Hugo Wollheim, who made repeated efforts, but in vain, to induce the Metropolitan Board to adopt his plan for purifying the sewage of the Metropolis. He is now endeavouring to win over the London County Council to his views, and invites attention to the effect of his process as applied to the sewage of Wimbledon. We believe Lord Rosebery has already visited the Wimbledon works, in company with the Medical Officer of the Council, and has witnessed the mode of carrying out the "Amines" process. Substantially, this appears to be a lime process, but added to it is a portion of fish brine—preferably herring brine. A mixture of milk of lime and herring brine applied to the sewage is said to have the effect of killing all bacteria; and we can quite believe it, more specially as there is the authority of Dr. Klein for the fact. It is further stated that by the application of this process, the sewage is made to exhale "a peculiar briny odour, similar to that of the sea "breeze." Mr. Webster claims to extract a disinfectant liquid from the sewage by means of his electric method; but this "sea breeze" certainly goes beyond him. However, we may put faith in the briny odour and the killing of the bacteria, without being perfectly convinced as to the character of the effluent. The killing of all bacteria is not necessarily advantageous. Very good authorities consider that the presence of certain kinds of bacteria in sewage is rather beneficial than otherwise. We are told on behalf of the "Amines" process, that it is "an entirely new departure in sewage "treatment;" and we think it is, so far as the herring-brine is concerned, but not so in respect to the lime, which is as old as the days of Higgs and Wicksteed. We should like to know distinctly how much lime Mr. Wollheim purposes to put into the sewage. We have an idea that the quantity is rather large; and if we are right, the fact is rather serious in the case of the London sewage, where every grain in the gallon reckons for ten tons in the day's discharge. Should the dose be 20 grains per gallon, the result would be 200 tons per day, producing some 2000 tons of sludge having 90 per cent. of water. In the case of a town of moderate size, this difficulty would, of course, be proportionately diminished. But Mr. Wollheim believes that he could purify the whole of the London sewage at a cost of £125,000 per annum. He reckons the expense of pressing at 2s. 6d. per ton, on 500 tons of sludge cake; and we are correctly told that every shilling above this which may be obtained by selling the cake as manure, will reduce the working expense by £25 per day. Hitherto, by the lime and iron process, it has been found the cheapest plan to cast the sludge unpressed into the Black Deep, or some such place, in the German Ocean; and we are rather afraid that this will be the end of all precipitation processes.

One of the most singular things stated in support of the "Amines" system, is in a scientific report by Dr. Klein. Taking certain samples of the "Amines" effluent, this authority observes that the number of bacteria found therein was "far below that found in ordinary drinking water, such as "the water supplied by the various London Water Companies, "after this had been stored for a few days, and in some cases "even the day after collection." Of course we are not surprised at the bare fact; but we are rather astonished at the use that is made of it. What is the impression that Dr. Klein expects to produce on the mind of the unsophisticated reader of such a statement? Is it that sewage treated by the "Amines" process becomes purer than the London Water Supply? If not, does he admit that the presence of bacteria, up to a certain point, is no test as to the quality of water? This microbe test, we submit, does not necessarily prove that the "Amines" mode of treating sewage produces a harmless effluent. Further proof is required; and, if forthcoming, so much the better. The "Amines" process may deserve all the confidence that the inventor has reposed in it; but we consider that this reliance on the slaughter of the microbes

is placing the merits of the plan on too narrow a basis. We may hope that the adoption of the process at Wimbledon will throw further light on the subject; and in the meantime we may commend the inventor for the untiring energy with which he has pressed his method upon the notice of the authorities. If he succeeds as he expects, he will have made the civilized world his debtor.

Essays, Commentaries, and Reviews.

GAS AND WATER COMPANIES IN THE STOCK MARKET.

(For Stock and Share List, see p. 468.)

The rise in the value of money, which we said last week might be expected, has come about with a vengeance; for on Thursday the Bank of England raised its rate from 3 per cent. (to which it had been advanced three weeks previously) to 4 per cent. General expectation perhaps had been in favour of a 3½ per cent. rate; and when the actual fact became known, prices gave way. Another cause of depression—especially for Docks and Home Rails—has been the unhappy strike. These influences, coupled with the normal scarcity of attendance, have checked speculation; but a fair extent of investment business has been got through. The Gas Department, however, has not been affected by the strike or anything else; for it has remained steady and very quiet. Scarcely a quotation has changed. Gaslight "A" has been dealt in to a limited extent—about as much as the preceding week—at an average price of about 262, without much deviation either up or down. The secured issues have not been touched; though there still exists a good demand for investment stocks of superior class. Hardly anything was done in South Metropolitans, except a few transactions in "B." The Company's stocks were not quite so strong; and the *ex div.* quotations on Thursday were slightly adverse. The debenture stock, however, is very firm. A parcel of Commercial old changed hands on Saturday at top price; and that was all the business of the week. In Suburban and Provincial undertakings, the only feature is the continued favour of Brentford, the old stock of which has risen 1 more. The Foreign division are quite without change. The Water Department opened rather briskly, but soon dwindled away into very quiet business. Changes in quotations were few, but favourable; being confined to a rise of 1 in Kent and in New River debenture. We make one more reference to the error we recently fell into as to the New River Company's dividend, in order to renew our appeal to the Secretaries of Gas and Water Companies to furnish us with all information which may properly and advantageously be made public. We use every endeavour to be correct; but in the absence of official information, may at times make mistakes. In extenuation of this specific error, however, we may remark that it was shared in by no less an authority than the Stock Exchange Committee.

The daily operations were: Monday was the busiest day in both Gas and Water; and all transactions were done at good figures. New River debenture rose 1. Tuesday was quiet, but equally firm. Brentford old was active, and advanced 1. Water was hardly touched; but Kent rose 2. Extreme quietude in Gas prevailed on Wednesday; but Water was somewhat more brisk. Quotations throughout were unchanged. Thursday's business was almost the same as Wednesday's, and quite without feature. Gas continued in just the same condition on Friday; the few transactions recorded presenting nothing which calls for remark. In Water, a single transaction in East London was all the business done. On Saturday both departments were equally inactive; and all quotations closed without further change.

ELECTRIC LIGHTING MEMORANDA.

LAYING ELECTRIC MAINS THROUGH THE LONDON STREETS—AN ELECTRIC LIGHT SYSTEM FOR LEICESTER—A PROFIT-SHARING DEVICE IN CONNECTION WITH A LIVERPOOL ELECTRIC LIGHT SCHEME.

Complaints are rife as to the way in which the Electric Supply Companies are carrying out the work of laying their mains through the streets of London. The Strand especially has been "up" for days, not in portions only, but along its whole length; and it may be imagined with what feelings the tradespeople of this important thoroughfare see the electricians ever dawdling over their work day after day, and packing up at night as though there was not the smallest occasion for extra despatch. This dilatoriness contrasts forcibly with the action of the City authorities when they recently relaid the pavements of Fleet Street, when the whole of the work was done by night, so as to spare the ordinary users of the thoroughfare all inconvenience. The slowness of electricians may be explained, as some observers have it, that they are not sure of their own plans, but have to learn as they go on. Or it may simply be that they are unused to this class of work, and fail to realize the requirements of main-laying in the heart of a crowded city. The worst of it is that the shopkeepers have no guarantee that the first nuisance will be the worst or the last. These electrical mains are a great experiment; and nobody knows how much trouble there may be with them on account of leakage. Thus, the Strand tradespeople have something to look forward to which may teach them when it comes that the putting of electric light wires underground is not an unmixed benefit.

The Corporation of Leicester have been discussing the advisability of taking up electric lighting, and have decided to apply for a Provisional Order. The Gas Committee have had the matter under their consideration, being quickened therein by the fact of four electric lighting companies having served notices on the Town Clerk of their intention to invade the town at the earliest opportunity. Some of these notices are not very formidable, being probably intended, as we have already pointed out in respect of other places somewhat similarly circumstanced, to instigate the Municipality to take the matter in hand for themselves. Corporations like that of Leicester, however, which provide gas for their districts, are nervously apprehensive of intrusive electricians; and it does not take much to frighten them into applying, against their inclination, for an Electric Lighting Order. So in the case in point, the Leicester people are afraid of letting any electric lighting company have a monopoly in their town, if only for 42 years. Mr. Lennard, who moved in the Town Council the adoption of the recommendation of the Gas Committee in favour of applying for an Order, did not argue that electric lighting was necessary for the town. He only stated that it is a very desirable thing where people can afford to pay for it. It was confessed that but for these notices on the part of some speculative companies, the Leicester Town Council would not have been advised to touch the matter at all, at least for the time being; but their hand has been forced, and now the object of the Gas Committee is to obtain an Order, and to use it as prudently and profitably as they can. They do not mean to make their application to the Board of Trade merely for the sake of blocking the way of other people who might mean business; but at the same time, they will feel their way in the matter with the utmost circumspection. Municipal affairs are ordinarily managed with much spirit and skill in Leicester; and we do not doubt that the Leicester Corporation electric lighting undertaking, when it comes, will be a respectable concern of the kind. The speech with which Mr. Lennard recommended the project to the Council was precisely what the occasion demanded—moderate, calm, and matter-of-fact. He did not promise anything great in connection with the electric light scheme, which he recognized must fill a small place in comparison with the Corporation gas undertaking. This reserve is more promising for the town than any fuss and rhodomondate with which the people might have been treated by one less sensible than Mr. Lennard.

A Provisional Order for an electric light company at Liverpool, recently confirmed by Parliament, contains the provision that if in any year there shall be any surplus of profits of the company after payment of a dividend at the rate of 7 per cent. per annum, then one-half of such surplus profits shall be applied in reduction of the selling price of energy for the following year, and so on from time to time, "and such reduction of price shall be made in such manner as the local authority shall in writing direct." This is noteworthy as the latest attempt at the manufacture of an automatic profit-regulating device after the model of the sliding clauses of a statutory gas undertaking. It remains to be seen how it will work in practice. On the surface it resembles the arrangement devised for the Ramsgate gas undertaking; and if it only works as well, the Liverpool people will have no reason to complain. The fixing of such a low maximum dividend as 7 per cent. before the profit-dividing arrangement comes into operation, is certainly a sign of the times.

Presentation to Mr. H. H. Jones.—Last Friday week, Mr. H. H. Jones was presented by the officers of the Commercial Gas Company, upon his acceptance of an appointment at the Bombay Gas-Works, with a diamond ring and pendant for his watch-chain, in token of their hearty good wishes for his future welfare.

Association of Public Sanitary Inspectors of Great Britain.—The annual meeting of this Association will be held at Folkestone to-morrow. The Mayor of Folkestone will receive the Association in the Exhibition at 11 a.m., and will open the proceedings. Addresses will be delivered by Dr. W. Bateman, J.P., Medical Officer of Health, on "Sanitation in Folkestone," and by Dr. C. E. Fitzgerald, M.D., on "Sanitary Advantages of Folkestone." After luncheon at the Town Hall, the party will proceed to view the Folkestone Gas-Works, and afterwards the water-works.

The South-West of England District Association of Gas Managers.—The next half-yearly meeting of this Association will be held at the ancient city of Winchester on this day week. Both the gas and the water works possess special features that are likely to be interesting to visitors; and on account of the proximity of the place of meeting on this occasion to London, a number of visitors are expected to be present, so it was thought advisable by the Committee not to submit any papers for consideration on this occasion. This will leave the members at liberty to make a leisurely inspection of the plant, &c., that Mr. Tinney has to show them; and at the same time to cultivate that friendly, informal intercourse that is generally admitted to be one of the chief advantages offered by these Associations. In arranging their programme, the Committee have not been unmindful of the fact that Winchester abounds with buildings of historical interest, in its Cathedral, College, almhouses at St. Cross, &c. The business meeting will be held at the gas-works, at one o'clock, when the Honorary Secretary (Mr. N. H. Humphrys) will submit his statement of accounts, the officers for the ensuing year will be elected, and two names will be brought forward for election as members—Mr. F. G. Dexter, of Wantage, and Mr. Temblett, of Andover. A tour of inspection round the gas and water works will then be arranged; and at three o'clock the members and friends dine together at the George Hotel.

MANCHESTER DISTRICT INSTITUTION OF GAS ENGINEERS.

A visit was paid by the members of this Association to Bradford last Saturday. The day was profitably and withal most pleasantly spent, though the visitors sustained at the outset considerable disappointment in being excluded from the station which the Corporation are establishing for the electric lighting of the central portion of the town. It was anticipated that the installation would be completed before the date of the visit; and a more or less formal inauguration had been contemplated, if not fixed for the previous day](Friday). However, things were not in readiness. The ceremony was postponed; and an intimation was sent to the President of the Institution (Mr. T. Banbury Ball, of Rochdale) that the contractors did not wish an experienced body of gentlemen such as the Association comprised, to see the installation in an unfinished state. This item had therefore to be omitted from the programme; and the visit to the electric light station is postponed to a future day.

The members living in the vicinity of Manchester assembled at Victoria Station; and travelled by the Lancashire and Yorkshire train leaving at 10.30 a.m. At various points on the way, they were joined by other members; and at Bradford were met by Mr. David Swallow, the Engineer in charge of the Bradford Corporation Gas-Works, Mr. William Wood, Manager of the Thornton Road works, and other gentlemen. Arrangements for the reception of the party had been made at the Alexandra Hotel; and luncheon was served there at noon. The anticipated visit to the electric light station being impossible, the party proceeded at once to the Birkshall Gas-Works—the newest of the four stations from which the Corporation supply gas to the town. The journey was made by steam-tram—the works lying off the Leeds Road, and at some distance from the centre of the town. Mr. Swallow acted as guide, and explained the plan upon which the works had been laid out with a view to their future extension. The site consists of 16 acres, one-third of which is, roughly speaking, covered with substantial buildings. In all the arrangements, an eye has been had to the triplication of the various parts. Some day the present retort-house will be extended, by the addition of other two of equal size, in line with it, and this plan of enlargement will be carried out all through the works. Much of the land is necessarily unoccupied at present; and the buildings, though most substantially erected of hard local stone, appear scattered and diffused. The plan upon which the works are being constructed is nevertheless calculated to make the very best of a not over-promising site. It is situated at a level of 214 feet above the lowest part of the town, but has the advantage of being contiguous to the Great Northern Railway. The coal is tipped into the stores connected with the retort-house direct from the railway-wagons; a line of rails being carried down each side of the retort-house at a sufficient elevation for the purpose. Out of the 400 retorts in the house, there were 50 at work on Saturday. They are in settings of five, the length being 20 feet (throughs) and the diameter 20 inches by 14 inches. The production is 6000 cubic feet per mouthpiece; the gas produced, with the use of 20 per cent. of cannel, being equal in illuminating power to 19 candles. In the retort-house each man has charge of two fires and ten retorts, and does four charges in the eight hours of which the day's work consists. Amongst the purifying plant is one of Messrs. Kirkham, Hulett, and Chandler's "Standard" washers; while the purifying-house itself contains six vessels 30 feet by 20 feet, four of which are used for oxide, and two for lime. Some of the members noticed an ingenious adaptation of a valve-shaped plug for the blow-off holes in the purifier-lids. Two of Messrs. Gwynne and Beale's larger sized rotary exhausters occupy the very handsome and lofty room erected for them; space being reserved, as in the other buildings, for four others of equal capacity, with the necessary connections. The meter, also to be one of three, is by Messrs. Braddock, and is capable of passing 100,000 cubic feet per hour. All through the works, the connections are 2 feet in diameter; enlarging to 3 feet at the outlet to the holders. Perret's patent furnace for consuming coke breeze has recently been applied to the boilers at the works, with satisfactory results. Amongst the other buildings visited were the locomotive-shed; the mechanics shop, where there are steam screwing and drilling machines; and a small laboratory, which contains one of Sugg and Evans's photometers. The tar and ammoniacal liquor wells have been placed under the paved roadway, which runs in front of the purifying-house and other buildings. From these the tar is pumped up into a small cistern, so situated that the tanks can be backed underneath it, and loaded. The liquor flows by gravitation to the Corporation's chemical-works, situated at a lower level of the town, where, in common with all that produced at the various stations, it is converted into sulphate of ammonia. Bradford, with a population estimated this year at 220,000, consumes about 1400 million cubic feet of gas; the quantity taken in the depth of winter running up to 8 million feet per day. There is as yet a considerable reserve of producing power; but if the future growth of the town keeps anything like pace with that of the past, the time is not far distant when the other powers of the extensive Birkshall estate will be utilized. When the visitors had thoroughly explored the works, the tram was again taken, and they returned to the Alexandra Hotel, where the business meeting was next held.

The thanks of the meeting were first formally voted to the Mayor and Corporation of Bradford, for permitting the visit to the works, and to Mr. Swallow for conducting the members over them. Two new members were elected—Mr. J. F. Bromley, the Manager of the Corporation Gas-Works, Batley, and Mr. Robert Hall, of the Matlock District Gas Company. Then came an interesting discussion (to be reported in the next issue of the Journal) on the paper, on "The Presence of Water or Moisture in Coal," which was contributed by Mr. Thomas Newbigging, C.E., of Manchester, to the proceedings of the meeting held on Dec. 1, 1888. A paper by Mr. W. S. Haddock, of Warrington, entitled "Notes and Extracts on Water Gas" followed. The discussion on this paper was postponed until the next meeting; but the thanks of the members were cordially tendered to the author. A suggestion made by the President on behalf of the Committee, that an extraordinary meeting should be arranged to be held during the present month, so as to afford the members an opportunity of visiting the Manchester Ship Canal works, was heartily taken up. The date of the meeting was left for the Committee to arrange; the last Thursday in September being suggested as a day which would meet the convenience of many present.

Tea was the next item on the programme; and a few toasts followed. The President coupled Mr. Swallow's name with "The Town and Trade of Bradford," and mentioned the fact that that gentleman had been associated with the gas undertaking for the unprecedented period of 66 years. Mr. Swallow, in responding, said he was glad to see the members of the Institution at Bradford; and he hoped this would not be their last visit to the borough. The toast of "Kindred Institutions" was coupled with the names of Mr. T. Bower, of West Hartlepool (who spoke for the North of England Association), and of Mr. C. E. Jones, of Chesterfield (who responded for the Midland and other Associations with which he is connected). Thanks were, at the President's suggestion, heartily accorded to Mr. Wood for the assistance he had rendered in arranging for the gathering; and then, with the health of the President, proposed by Mr. T. Duxbury, of Darwen, and heartily drunk, the pleasant proceedings of the day came to an end.

Cooking by Electricity.—The Hotel Bernina, at Samaden, has for some time been lighted by electricity; power being supplied by a waterfall. As during the day this power is not required for lighting, and is therefore running to waste, the proprietor of the hotel has hit upon the idea of utilizing the current for cooking when it is not required for lighting; and an experimental cooking apparatus has been constructed. This contains German silver resistance coils, which are brought to a red heat by the current; and it is reported to be possible to perform all the ordinary cooking operations in a range fitted with a series of such coils.

The Annual Meeting of the Iron and Steel Institute.—The meeting of the Iron and Steel Institute in Paris on Sept. 24 and following days promises to be of great interest; and a large attendance of members is expected. They will be received and entertained by an influential Committee under the presidency of M. Eiffel; and the French Society of Civil Engineers will entertain them at breakfast on the Eiffel Tower. Among the papers will be one by Sir Lowthian Bell on the subject of water gas; and Professor Jordan will deal with the mining and metallurgical exhibits at Paris. Excursions will be made to the iron-works of the Loire and St. Etienne, and of the Nord, and to other centres of the iron and steel industry.

An Unfavourable Testimonial for Oil Lighting.—While Barnet is continually supplying us with evidence of the vagaries of the electric light, Erith affords illustrations of the little freaks peculiar to oil lighting. The Finance Committee of the Erith Local Board, at the last meeting of that body, recommended for payment a number of accounts, among which was one from the Defries Safety Lamp Company for public lighting. We give the item as it appeared—"Defries Safety Lamp Company lighting quarter ending July 21, 1889, £161 8s., *less* £7 7s. 6d. *penalties for lamps found not lighted.*" This speaks for itself; and we commend it to the consideration of those local authorities who are contemplating adopting oil as an illuminant for the streets under their control.

The Largest Direct-Acting Pumping-Engines in the World.—A pair of engines have just been constructed by Mr. H. R. Worthington, of New York, for the National Transit Company's oil pipe-line. Each engine delivers 25,000 barrels of oil, against 1500 lbs. pressure per square inch in twenty-four hours. These engines are claimed to be the largest direct-acting pumping-engines in the world. They are at a place called Osborne Hollow. Each engine has two 41-inch high-pressure steam cylinders with 82-inch low-pressure steam cylinders, driving 12-inch double-acting plungers, and is supplied with steam at a pressure of about 100 lbs. per square inch. There are four cylinders for each engine; one engine being a reserve or stand-by. The high-duty attachment on each engine weighs about 3500 lbs.; and when the engine is running under sixteen expansions and at a piston speed of 65 feet per minute, it is estimated that the compensating cylinders are developing an energy that could not be imparted by a fly-wheel of a less diameter than 40 feet, and weighing 400,000 lbs. By this one example the difference between the Worthington high-duty and fly-wheel systems is made strikingly apparent. The slow piston speed on which this calculation is based is about as fast as has been found desirable on this extremely severe work. The engine is under constant service, running twenty-four hours a day, and showing a monthly duty of over 100,000,000 foot-pounds, calculated on the basis of 10 lbs. of feed-water being evaporated in the boilers for each pound of fuel.

Technical Record.

NOTES AND EXTRACTS ON WATER GAS.

By Mr. W. S. Haddock, of Warrington.

[A Paper read before the Manchester District Institution of Gas Engineers, Aug. 31.]

I have had no practical experience of the manufacture or use of water gas. Therefore this paper mainly consists of extracts and notes from various journals, reports, &c.

Pure water gas is a mechanical mixture of equal volumes of hydrogen and carbonic oxide. The percentage by weight is, therefore, about 3·5 per cent. of hydrogen and 96·5 per cent. of carbonic oxide. Hydrogen and carbonic oxide are both transparent, inflammable, invisible, odourless, and almost insoluble gases. Hydrogen was mentioned by Paracelsus in the sixteenth century, but first obtained in a pure state by Lavoisier in 1766. It is not a poisonous gas, but will not support life. Carbonic oxide was discovered by Priestley, and is a very poisonous gas. In 1793, Lavoisier discovered that, by passing steam over red-hot charcoal, a permanent gas resulted, which is known as water gas. This laboratory experiment is the basis of all water gas manufacture. The reaction takes place in two stages, thus—

$$C + 2H_2O = CO_2 + 2H_2$$
$$C + CO_2 + 2H_2 = 2CO + 2H_2$$

Pure carbon being very scarce, anthracite coal and coke are substituted in the manufacture of water gas on a large scale. In England the deposits of anthracite coal are limited, and very insignificant as compared with bituminous coals; whereas in America there are large supplies of anthracite coals.

*Pennsylvania Output.**

	Tons. (2000 lbs.)	Value of Mine.	Value per 2000 lbs.
Anthracite	39,506,255	$79,365,244	$2·00
Bituminous	30,876,602	27,806,941	0·90

Since the discovery of Lavoisier in 1793, innumerable attempts have been made to introduce water gas on a commercial scale; but without any permanent success in England. Priestley, Cavendish, and Black, devoted attention to this gas; and Table No. 1 gives a list of some of the early patents. Great attention was paid by the gas industry to the subject of water gas from 1845 to 1856; and many experiments were made, and large sums expended. But it was found to be too dangerous for distribution, and was abandoned after the scientific examinations made in Paris in 1856, where the gas was condemned and forbidden on account of its poisonous properties.†

Prior to 1852 the manufacture of water gas was conducted in vessels heated from the exterior. A description of Michael Donovan's, Manby's, and Val Marino's process will be found in the Journal of Gas Lighting, Vol. XXXI., p. 831. Mr. Spice gives the cost of making water gas at 6d. per 1000 cubic feet.‡

A water gas works was constructed at Narbonne, France, in 1856; and the gas burned for raising a platinum burner to incandescence.§ The composition of the Narbonne gas is given in *La Genie Industriel*, Vol. II., p. 148, as follows:—

	Per Cent.		Per Cent.
Watery vapour	3	Carburetted hydrogen	1
Carbonic acid	3	Hydrogen	89
Carbonic oxide	2	Loss	2

The results obtained by the Kirkham process were so greatly superior to the old processes that all water gas on a large scale is now made by the interior heated generators.

The United States may be considered the seat of the water gas industry; and I have given in Table No. 2 an extract from the Brooklyn report 1883, showing the companies who make gas by patent processes. I have not given the names of companies supplying coal, wood, and naphtha gases which are stated thus—

446	companies make coal gas; average price	$2·78
120	„ use patent processes (oil, wood, &c.)	3·73½

Recapitulation of Patent Processes.

	No. of Companies.	Average Price.
Lowe	35	$2·706
Tessié-du-Motay	4	2·437
Pattons	8	5·67
Smith and Goldthorp	4	4·00
Wurtz's	4	9·50
Campbell and Hanlon's	1	1·50 to 2·10
Mackenzie	2	2·00
Kennedy's	1	2·25

I will now give some extracts from the Journal of Gas Lighting concerning the Lowe and Tessié-du-Motay processes.‖ The Lowe apparatus consists of four vessels—(1) The generator or gasogene; (2) the superheater or fixer; (3) the boiler; (4) the washer. The generator is an iron cylinder, brick-lined, and in appearance like a foundry cupola. The superheater is an iron-cased brick cylinder, which has an open arch, about 2 feet from the bottom, upon which rest the loose bricks with which the interior is filled. Fuel is placed in the generator, and raised to incandescence by superheated air. The escaping inflammable gases given off are conducted to the bottom of the superheater, and burned with heated air. The mass of bricks in the superheater is thus raised to a white heat. When the temperature of the fuel in the gasogenes is about 2000° to 2500° Fahr. the air current is withdrawn and superheated steam is passed downward through the incandescent mass. If for illuminating purposes, a thin stream of crude petroleum or other hydrocarbon must be introduced at the top of the gasogene whilst the steam is entering. The decomposed steam and hydrocarbon vapours are then led through the intensely-heated superheater, which still further decomposes the hydrocarbon vapours and fixes them. A jet photometer is fixed on the outlet pipe; and the quality of the gas determines the rate at which the petroleum must be introduced. From the superheater, the hot gases are led through the tubular boiler and washer to the purifiers and holder. Owing to the cooling effect of the steam, the temperature in the gasogenes is reduced below the point at which decomposition takes place—stated by Julius as 932° Fahr. The steam and enricher are then turned off, and the gasogene opened to allow the residual gas to burn out before turning on the air blast again. The time of changing the blast and steam varies with different fuels, and is found by experience.

The Tessié-du-Motay process consists of rectangular gasogenes, carburetters, beds of retorts, and washer. The gasogenes are gas-tight iron cases lined with fire-bricks. The carburetters consist of a series of cast-iron boxes, so placed over each other that naphtha, or any similar carburetting agent, being allowed to flow into the top of one, a depth of (say) 4 inches will be attained in all, because they overflow from one to another. These boxes are water jacketted, so as to enable a uniform temperature of from 160° to 180° Fahr. being kept up. The gasogenes being charged with fuel are blown up with air, and steam is passed through the incandescent mass, as in the Lowe process. The gas is then cooled and lead to a holder, from which it is passed through the carburetters, and becomes saturated with naphtha vapours, which are decomposed and fixed by being passed through a bench of retorts.

Owing to the limited time I have been able to bestow on this paper, the cost of coals, oil, and labour per 1000 cubic feet are not so complete as I should wish; but the following extracts will give an idea of the opinions of various people.

Mr. E. G. Love, Ph.D. (gas examiner), read a paper before the American Association for the Advancement of Science, at the Boston meeting in 1880, in which he stated that there are ten Companies in New York, all (with one exception) furnishing illuminating gas to the city at the present time—New York, Manhattan, Mutual, Municipal, Metropolitan, Harlem, Central, Northern, Knickerbocker, and Yonkers. The Manhattan Company supply coal gas enriched with cannel. The coals employed are from Pennsylvania and Virginia, with Cannelton cannel in the proportion of 87 per cent. coal, and 13 per cent. of cannel. For the six months ending June 30, 1880, 100,000 tons of coal were carbonized; 10,550 cubic feet of gas were produced per ton; and the average illuminating power was 19·76 candles. The Harlem Company in 1879 carbonized 23,392 tons of coal, which yielded 10,750 cubic feet of gas per ton, of 17·59-candle power. The Metropolitan Company carbonized 49,255 tons in 1879, with a yield of 11,618 cubic feet of 12 to 16 candle gas, which is enriched with naphtha (costing 2 to 3 cents per gallon, and using 4 to 5 per cent. by weight). One gallon is calculated to produce 70 cubic feet of about 60-candle gas. The average illuminating power of the mixed gas in the six months ending June 30, 1880, was 20·33 candles. The Mutual Company manufacture the body of their gas from Virginia pine (price $5·22 per cord). From September, 1879, to August, 1880, they distilled 2125 cords, yielding 100,010,800 cubic feet of gas, or about 47,000 cubic feet per cord. The charges weighed 80 lbs; and averaged 41 charges per cord. The coal is made to yield 15,000 cubic feet per ton of 3 to 4 candles. The mixed gases were carburetted with 4½ gallons of naphtha per 1000 cubic feet. The average illuminating power during the first six months of 1880 was 26·53 candles.

In Table IIIa. the following analyses were made at different times: Nos. 1, 2, and 3 are gases made from wood and coal, and No. 4 is an analysis by Mr. Bowen in 1877 from coal gas enriched with naphtha.

The Municipal and New York Companies work the Tessié du Motay process. Anthracite coal is used, charged hourly at the rate of 700 to 1000 lbs. The yield per ton is 45,000 cubic feet. A half-burned coal is used under the boilers. Deducting this coal, the yield is from 55,000 to 60,000 cubic feet per ton. The gas is enriched with 5 gallons of naphtha per 1000 cubic feet. The illuminating power in the first six months of 1880 was 29·68 candles.

Table IIIb. gives an analysis of the gases made by the above Companies. All the Companies supplied the gas at the rate of $2·25 per 1000 cubic feet in 1883.

The following is extracted from a letter (dated June 10, 1889) from Mr. W. G. Johnstone, Assistant to Dr. Leeds, at the Stevens Institute, Hoboken, N.J.:—"The Consolidated Gas Company of New York (seven large works), and many other works in the States, make both coal and water gas—that is, they combine the two processes in one works. More than half the gas used in New York is water gas made, in a modified Tessié du Motay plant, from anthracite enriched with naphtha, which is run into New York in pipes, and sold at under 2 cents per gallon. Anthracite is the only satisfactory material from which to manufacture water gas. It is almost pure carbon (the American anthracite, not the Welsh, which is neither so pure nor so dense), very dense, and is completely consumed from outside inwards, to the end; and the heat in the gasogenes thus keeps up to the end. The gas coke, on the other

* Extract from United States Coal Statistics, 1887.
† See Journal, Vol. V., p. 334.
‡ See Transactions of The Gas Institute for 1875, p. 53.
§ See *American Gaslight Journal*, October, 1860, p. 123.
‖ See Vol. XXXI., pp. 943 and 979; Vol. XXXII., p. 87.

hand, is too light and porous, and requires more frequent blowing up. Copy of some notes, recently taken by me at the Hoboken Gas-Works: Original water gas, nearly colourless flame, little smell, sweetish. After addition of naphtha, yellow flame. After crackling (retort treatment), unpleasant smell; flame, white." Here follows a description of the process, which is as described for the Tessié-du-Motay process. The steam is introduced at 105° C., and for five minutes each at the top and bottom of the gasogene, a ton of coal gave 46,000 cubic feet of illuminating gas.

Here is an extract from a letter (dated June 14, 1889) by Mr. C. H. Nettleton, the Secretary of the Derby (Conn.) Gas Company, who make coal gas, which was sold in 1883 at $2·12½: "In regard of cost of water and coal gas, there is a very great difference in cost in various sections of the country, owing to the difference in cost of the crude materials—coal and oil, also labour. It has come to a point, practically, where the local conditions of each works determine which is the cheaper gas to make. For instance, in Columbus, Ohio, coal is purchased at $1·50 to $2·0; while here the cost is $4·25. In Chicago, the Lima crude oil is 1·6 cents per gallon; whereas in the east, it varies from 2½ to 3 cents. In the eastern sections of this country, the cost of gas in the holder (expense in distribution remains the same) is, on an average, 40 cents per 1000 cubic feet, for each kind of gas. These figures will vary somewhat, depending on local conditions. The water gas has the advantage in being a higher candle power; the coal gas in being safer, and in some ways more satisfactory."

In Table No. IV., I have given the value of material, &c., at Philadelphia, for the current year. A new water gas plant has been recently started. Formerly all coal gas was made in Philadelphia, and is thus spoken of at the Council meeting held in Philadelphia on February 21, 1889. Mr. Councillor Henderson submitted the following resolution:—"Whereas, by the introduction of water gas, the cost of illuminant to the city has been greatly reduced, and whereas the rate charged to consumers is higher than in many of the principal cities of the country, therefore be it resolved to consider the advisability of reducing the price from $1·50 to $1·25 per 1000 cubic feet." Councillor Henderson remarked that Director Wagner said he expected the city to make a clear profit of half a million dollars this year. The *American Gaslight Journal*, commenting upon the above, said: "We incline to the belief that a compromise of (say) $1·30 per 1000 feet will be agreed upon."

The following are a few figures respecting the working of the Lowe process at Toronto from Feb. 17 to Sept. 30, 1880:—Crude oil per 1000 cubic feet, 4·29 gallons; anthracite, 59 lbs. for gasogenes, and 4 lbs. for boilers, with 7 lbs. of bituminous coal; three stokers to four sets of producers, with five in case of emergency; four stokers to six sets of producers, with seven in case of emergency. Production in twelve hours from four sets of producers, 270,000 cubic feet; six sets, 362,100 cubic feet; or about 100,000 cubic feet per man.

I give the following figures from the JOURNAL OF GAS LIGHTING:—Mr. J. Ferguson Bell's estimate (May 28, 1889)—Coal gas, 21d. per 1000 cubic feet at Stafford; water gas, 30d. Mr. R. Dempster's figures (Feb. 12, 1889)—Estimated cost of carburetted water gas delivered into the holder, 3s. per 1000 cubic feet. British Water Gas Syndicate (June 11, 1889)—Cost of pure water gas in the holder, 3·91d. per 1000 cubic feet at the Leeds Forge.

The calorific values of the carburetted and uncarburetted water gas, also coal gas, were thus stated in the *American Gaslight Journal* in January 1889, by Mr. H. C. Allen, of the Allen-Harris process—

Comparative Power of Gases, in heating equal Weights of Water.

	Below 100° C.	Above 100° C.
Water gas carburetted	2959	1861
" " not carburetted	3100	2757
Coal gas	2974	1627

Comparisons of the calorific intensities of the different gases are taken as: H, 5788° Fahr.; CO, 5425° Fahr.; CH_4, 4820° Fahr.; olefiant gas, 5481° Fahr. The intensities of the flame were as follows:—H, 4980° Fahr.; CO, 5425° Fahr.; CH_4, 1277° Fahr.; olefiant gas, 1001° Fahr.

From a paper read at the Western Gas Association in 1888, by Mr. Walton Clark, of Kansas City, Mo., the following figures are taken:—

	Heat Units Per Cub. Ft.	Temp. of Flame.
Coal gas	630	4·349° Fahr.
Water gas	290	4·797° "
Producer gas	95	2·961° "

Mr. Bell's figures are as follows (See JOURNAL, May 21, 1889):—

	Heat Units Per Cub. Ft.	Temp. of Flame.
Coal gas	673	3970° Fahr.
Water gas	291	4320° "
Producer generator gas	132	2290° "
Producer water gas	73	—

Mr. B. H. Thwaite, in a letter published in the JOURNAL for April 9 last, gives the relative thermic values as follows:—Water gas, 2813 units; coal gas, 5511 units; and generator gas, 1470 units.

Mr. Thomas Fletcher, of Warrington, in reply to an inquiry I made, writes: "In some tests made about three months ago with Warrington 18½-candle coal gas, one of our ordinary 'Rapid' bath-heaters—heating water from 47° to 100° Fahr. at the rate of one gallon per minute—I got 630 units per foot actual work done. The same size of the same apparatus was tested at Sleaford by Mr. Wimhurst, along with Mr. Gill, the Water-Works Manager. At the rate of 30 gallons in 28 minutes—water entering at 52° and leaving 110°—they obtained 644 units per foot." Mr. D. Kinnear Clark gave a still higher duty. Mr. Fletcher also stated that, in supplying stoves for water gas, the burners were always made double the size of those used for coal gas.

As to the relative safety of coal and water gas, I give the following from a Brooklyn report of 1883:—"Resolved that the Commissioner of Health make an investigation as to the number of deaths caused by water and coal gas." In this report, the Commissioner states: "The reports of deaths by gas poisoning in these two cities [Brooklyn and New York] have been examined into most carefully by reference to all available original records. In respect of Brooklyn, all death certificates on file in the Health Department have been examined, further all the Coroner's inquest papers in the County Clerk's Office bearing upon the causes of death were examined, to enable me to make as full and as accurate a record of deaths and injuries from both kinds of gas as it is possible to make." They are stated thus—

—	Water Gas.		Coal Gas.	
	Deaths.	Injury not Fatal.	Deaths.	Injury not Fatal.
Brooklyn	8	13	3	—
New York	44	—	21	—

Commenting upon this report, the *American Gas Journal* of Aug. 2, 1883, says: "We shall endeavour, however, to analyze the report given above, commencing with Brooklyn. In the report, it is stated that there have been three deaths from coal gas since 1849; and this when all the gas manufactured and sold has been coal gas. In the period embraced—from 1849 to 1881, 33 years—the quantity of gas sold was 22,000 million cubic feet. At the same time there have been eight deaths from water gas between 1881 and 1883; and the quantity of gas sold was about 1200 million cubic feet. In the City of New York the number of deaths from water gas is stated as 45, and from coal gas 21; at the same time stating verification not attempted, which is a good proviso, as we know it would be an impossible thing to verify that these deaths had been caused by illuminating coal gas since its introduction in 1823, or a period of 60 years."

From various reports made to the Brooklyn Health Commissioner by Mr. Henry Morton, Chemistry Professor of Stevens Institute, Hoboken, N.Y., I make this extract: "I regard carbonic oxide as a highly poisonous gas, much more dangerous than any other constituent of illuminating gas. But I also hold that the greater danger attending its use is very limited in its range of application, because there will be but few cases when it gets out of the pipes; and, secondly, I believe that risk will have little to do with the introduction and use of anything which is otherwise desirable. Witness steam, matches, electricity, nitroglycerine, &c.

Dr. Frankland, in the course of a report, said: "In compliance with your request, I have read the reports of Dr. Henry Wurtz, dated January 1, 1878, and March 4, 1878, on the composition and properties of the gas of the Municipal Gaslight Company of New York, and also the articles published by Professor H. Morton, in the *American Gaslight Journal* of March 2 and 16, 1878; and having been called upon to express the adaptability of water gas for lighting and heating purposes, I have no hesitation in saying that it may be used with safety, both in public buildings and private houses. I should be delighted to substitute this pure and powerful illuminating agent for the gas with which my house in London is at present supplied, although it is used in all bedrooms." I may also mention there are a great many more reports, some of which deny the danger of using water gas and others emphatically assert the contrary. These reports all assume the gas to be carburetted; and therefore to have a dangerous smell. I may also mention that the restrictions as to gas containing a maximum of 10 and 8 per cent. of carbonic oxide in Massachusetts and New Jersey respectively have been withdrawn.

The cost of carburetting water gas in England is prohibitive, or we should certainly have had attempts from some of the patentees of the water gas processes to introduce the gas into this country. In the spring of this year, a Syndicate was formed to work a patent process of incandescent lighting from pure water gas in this country; and we all know the effect caused by a pamphlet which was published at the time, and from which I have made the following extracts:—At p. 37, in a report on the water gas plant at the Leeds Forge, Mr. W. Lawrence Wildy, the Engineer, says: "Gas first made on the 29th of March, 1888, and has now been in operation nine months. During that period we have had no accident, delay, or hitch of any sort. Gas made, 25,575,600 cubic feet. Coke used, 752 tons; 34,000 cubic feet per ton. Quality of the gas: Hydrogen, 50 to 51 per cent.; carbonic oxide, 44 to 45 per cent. The cost, including fuel, labour, steam and water, interest and depreciation, at 15 per cent. (after allowing for the value of the producer gas), is 3¾d. per 1000 cubic feet. Economy effected—a reduction in cost of gas of 62 per cent.; in wages, of 50 per cent.; and in both together, of 58 per cent. Saving in coal for boilers, 895 tons."

The above results hardly need comment; they are impossible for these reasons—(1) To get nine months' experience from the 29th of March to the 30th of November. (2) To save 895 tons of coal by using 752 tons of coke, from which 25,575,600 cubic feet of water gas have been made for other purposes.

In the same pamphlet (pp. 20 and 21), it is stated that a ton of *common* gas-works coke produced 34,000 cubic feet of water gas;

and that three-quarters of the fuel in the generator are consumed in blowing the generator hot. As a rule, good coke from gas-works contains from 10 to 12 per cent. of moisture, and 5 to 10 per cent. of ash. Take the coke as containing 90 per cent. of carbon, then, theoretically, a ton will yield 60,000 cubic feet of carbonic oxide.

	Cubic Feet.
One-fourth of carbonic oxide to water gas	15,000
Add an equal volume of hydrogen	15,000
Total water gas	30,000

Or the result of nine months working gives 4000 cubic feet per ton more than it is possible to obtain theoretically.

Quoting from the same pamphlet, on p. 27, we find these words: "The arrangement of lighting employed is that of incandescent magnesia on the Fahnejelm system. This consists of a comb composed of magnesia rods suspended by a wire over the gas-burner. The flame renders these rods white hot; producing an intensely bright light. With a consumption 5 cubic feet per hour, the combs give a light equal to 22 candles by photometric test with the Siemens and Halske standard."

The Fahnejelm system was introduced into America several years ago; and as far as I can make out, it is not making any headway. I give a few extracts respecting this burner. Extract from a paper read by Mr. George Graeff, jun., of Philadelphia, Pa., before the Ohio Gaslight Association, March 21 and 22, 1888—The Fahnejelm comb, with its little pencil of magnesium oxide, is fairly familiar to perhaps the majority of members present. This burner has been in use for several years at Essen, Germany; and the different European Associations uniformly state that they give satisfactory results both as to light and life.

Consumption, Litres.	Ignition Pressure, Inches.	Candle Power.	Candle Power per Cubic Foot.
145	2	16·2	3·1
152	2	18·1	3·3
164	2	24·0	4·0

28·31 litres = 1 cubic foot.

The following is the result of an experiment (the average of 30 tests) made on Nov. 16, 1885, at the Novelties Exhibition, New York, with Lowe fuel gas:—5·64 cubic feet, at 1·5 inches pressure, gave 16·88 candles, or 2·99-candle power per cubic foot.

New York City Tests.

Consumption, Cubic Feet.	Ignition Pressure, Inches.	Candle Power.	Candle Power per Cubic Foot.
6·6	1·3	23·0	3·48
5·5	1·5	21·9	3·98
5·6	1·0	19·6	3·50

In a paper read at the Western Gas Association meeting on May 9, 10, and 11, 1888, at Chicago, Mr. E. Lindsley, of Cleveland, Ohio, speaking of the Fahnejelm burner, stated: "The back is a grooved piece of metal, in length corresponding very nearly to the width of the heating flame, which is produced by the gas from an ordinary flat-flame burner. The teeth are small rods of magnesia (say) 2 inches long, and about No. 18 B.W.G. Double rows of these are secured to the metallic back, by a suitable cement, within the above-mentioned groove; and this simple device is supported over the gas-flame. The result is a very white and beautiful light. They are unsuited to rough handling, and doubtless most disinterested people would regard them with suspicion on account of their frailty. They are particularly adapted to the action of the uncarburetted water-gas flame, although good results may be obtained with the Busen flame of common coal gas, or the same largely diluted with air.

Mr. Egner, of St. Louis, has given expression to the following:—"We have a water gas apparatus at our works; and tried it (the Fahnejelm burner) with pure water gas. We placed a Fahnejelm burner at one end of a photometer bar, and placed an Argand on the other. We found that 3 feet of our illuminating gas consumed in the Argand gave as much light as 5 feet of water gas passed through the Fahnejelm burner. We could not see any economy in that burner for us; and we did not buy it. About an hour ago, I visited a place where they exhibited this burner in Chicago; and this is what I saw: 5½ cubic feet of uncarburetted water gas burned in a Fahnehjelm burner gave a light 56 per cent. greater than that from 4½ cubic feet of Chicago coal gas burned in the ordinary way."

In the book on "Water Gas: Its Chemistry, History, and Prospects," recently published by the *Iron and Coal Trades Review*, on p. 27, we find it stated that the Farnejelm comb of the Syndicate seems to be the most promising form of incandescent burner yet discovered; and the power of this fluctuates so much that it loses more than half its power in 100 hours. Now in this we are giving their full value to the statements of the interested parties; for up to this time there has not been put forward a single statement by a well-known and competent authority as to what the illuminating power really is, how it is measured, and whether the light is the same at right angles to the comb and in a direction normal to this."

In concluding these extracts, I feel convinced that each member will be able to satisfy himself that pure water gas does not contain either the lighting or the heating effects which are claimed for it. The only advantage which it possesses is in its high initial temperature, which makes it suitable for steel welding and other operations requiring very high flame temperature. In America water gas is not found to have a greater diffusive power than ordinary coal gas. This good quality would appear to be absent in the uncarburetted water gas (theoretically Leeds Forge gas has about the same specific gravity as coal gas), for Mr. Samson Fox, in addressing the shareholders of the Water Gas Syndicate, at the meeting at the Cannon Street Hotel, London, in May last, stated that, in starting the water gas at his house in Harrogate, he shut off every light in the house, and put on the gas, and lost equal to 310 cubic feet in the night, and found he had been paying so much a year for lost gas. I have worked out this leakage, and find it to be 226,300 cubic feet per annum of 24 hours per day, or 113,150 cubic feet per twelve hours per day.

TABLE I.

The History of the Production of Water Gas.

(1) Water, decomposed by means of incandescent carbon in the year 1793 by Lavoisier. This subject also engaged the attention of Priestley, Cavendish, and Black.
(2) Donovan took out a patent in Oct., 1830,
(3) And Jobard, of Brussels, in 1832, for impregnating water gas with hydrocarbon vapours.
(4) Selligue engaged in water-gas researches in 1833.
(5) Patents were taken out by Montauban in 1838 for producing water gas.
(6) Edward Manby took out a patent in 1839.
(7) Val Marino took out patents in 1839.
(8) Alex. Cruikshank took out patents in 1839.
(9) Radley took out a patent in 1845.
(10) James Murdock took out a patent in 1845.
(11) Gillard established water-gas works at Passy, near Paris, in 1846.
(12) Stephen White took out a patent in 1847.
(13) Alex. A. Croll took out a patent in 1848.
(14) Webster took out a patent in 1850.
(15) John and Thomas Nesham Kirkham took out patents in 1852, which cover virtually the methods in use to-day—known as the Tessié-du-Motay and Lowe.
(16) Selligue's process has given rise to White's, Le Prince's, Isard's Baldham and Gune's, Kirkham's, Longbottom's, and Wiederhoet's processes.

TABLE II.

State.	Company.	Price.
Lowe's Process.		
California	Oakland	$3·50
"	San José	3·50
Connecticut	Middletown	2·50
Delaware	Milford	3·50
Illinois	Pullman	2·25
"	Sterling	2·80
Maryland	Baltimore Consolidated	1·90
New Hampshire	Keene	3·50
New Jersey	New Brunswick	2·50
New York	Clyde	3·00
"	Fort Plain	4·00
"	Newburgh	2·25
"	Port Jervis	2·50
"	Saratoga Springs	2·50
North Carolina	New Berne	3·00
Ohio	Elyria	2·20
Pennsylvania	Bethlehem	2·37½
"	Catasauqua	2·50
"	Carlisle	2·50
"	Columbia	3·00
"	Harrisburg People's	2·00
"	Honesdale	3·00
"	Lancaster	2·00
"	Pittsville	2·25
"	Pittston	3·00
"	Scranton	2·00
"	Scranton Hyde Park	2·25
"	Sheppensburg	2·50
"	West Chester	2·80
"	Wilkesbarre	2·50
"	Williamsport	2·50
Vermont	Brattleboro	3·15
"	Burlington	3·00
"	Rutland	3·00
Wisconsin	Appleton	3·00
Hanlon's Process.		
Colorado	Georgetown	$4·50
Connecticut	Willimantic	2·50
Massachussetts	Lexington	6·00
New Hampshire	Dover	2·70
New York	Nyack	3·00
"	Sag Harbor	4·00
Pennsylvania	Bristol	2·50
"	Philadelphia West Manayunk	1·50
"	Royersford	3·20
Rhode Island	Warren	4·00
Vermont	Montpelier	2·00
"	Windsor	5·00
Tessié-du-Motay.		
New York	New York	$2·25
"	Knickerbocker	2·25
"	Municipal	2·25
"	Troy Citizens	3·00
Water Gas.		
New York	Delhi	$2·50
Brewers Oil.		
New York	Penn Yan	$2·50
Patton's Process.		
Iowa	Independence	$2·50
"	Waterloo	2·50
Illinois	Dixon	8·00
"	Macomb	2·50
Ohio	Defiance	10·00
Pennsylvania	Ashland	10·00
"	Plymouth	1·88
Wisconsin	Neenah	8·00
Smith and Goldthorp.		
New Jersey	Arlington	$4·00
Pennsylvania	Newton	3·50
"	Parker City	6·50
"	West Newton	2·00

State.	Company.	Price.
	Wurtz's Process.	
Indiana	Seymour	$2·00
"	Warsaw	2·00
Mississippi	Holy Springs	3·50
Pennsylvania	Sanbury	2·00
	Makenzie Process.	
New York	Long Island City	$2·00
Pennsylvania	Pittsburg Consolidated	2·00
	Campbell and Hanlon's Process.	
New Jersey	Patterson People's Company	$1·50 to 2·10
	Kennedy's Patent.	
New York	Mutual	$2·25
	Allen-Harris Patent.	
New York	Rondout	$3·00
	Slade.	
New York	Yonkers	$2·00
	Strong.	
New York	Yonkers West Chester	$2·00
	H. H. Egerton's Process.	
Texas	Waco	$3·53

TABLE IIIa.

—	1 July 16, 1880.	2 Aug. 6, 1880.	3 Sept. 8, 1880.	4 Nov. 27, 1877.
Hydrogen	9·65	9·32	12·75	7·53
Marsh gas	43·55	42·49	39·21	48·63
Carbonic oxide	8·63	7·64	12·33	6·70
Illuminants	15·55	15·45	15·22	14·43
Nitrogen	19·92	22·79	19·36	19·85
Carbonic acid	1·48	2·16	0·89	—
Oxygen	1·22	0·15	0·24	2·86
Sulphuretted hydrogen	—	—	Trace	—
Total	100·00	100·00	100·00	100·00

TABLE IIIb.

Constituents.	Manhattan Co.	Harlem Co.	Metropolitan Co.	New York Mutual Co.	New York Co.	Municipal Co.
Hydrogen	45·79	46·53	35·41	10·57	27·14	26·25
Marsh gas	39·01	42·38	42·66	41·75	25·35	28·91
Carbonic oxide	6·31	3·14	9·17	9·53	26·84	27·12
Illuminants	6·38	6·31	7·41	15·41	14·63	15·80
Nitrogen	2·51	0·50	5·35	20·69	2·87	1·92
Carbonic acid	—	1·08	—	1·51	3·02	—
Oxygen	—	0·06	—	0·54	0·15	—
Sulphuretted hydrogen	—	Trace	—	Trace	—	—
Total	100·00	100·00	100·00	100·00	100·00	100·00

These analyses were made from time to time as opportunity presented. In some cases I have given the average of several analyses, in the hope of thus arriving at a fair estimate of the constituents present in the gases of the different Companies. The method of analyses followed was that of Professor Bunsen. With information as to the nature of the gas, gathered from daily photometric tests, I have had opportunity of analyzing these gases at times when they presented some unusual features. I find considerable variation in composition, especially in those cases enriched by naphtha. The analyses given, however, I believe to fairly represent each gas. I regret that the time at my disposal was so limited as to prevent my separating the light-giving portion, or illuminants, of the different gases. This would have been specially interesting in the water gas of the New York and Municipal Companies.

TABLE IV.

From the *American Gaslight Journal*, June 1888, p. 414, I find that in June 1888, the Philadelphian Gas Trust advertised for tenders for gas delivered into the holders, 3,000,000 cubic feet per day. There was only one bidder, the New Jersey Company, and their proposals were as follows :—

Flannery Process.—Candle power (minimum in all instances), 22; carbonic oxide content (maximum in each), 26 per cent.; price per 1000 feet, 45 cents; royalties, 2½ cents per 1000 feet; estimated cost of works, $250,000.

Motay and Jermanowski Process.—Candle power, 30; carbonic oxide, 26 per cent.; price per 1000 cubic feet, 48 cents; royalties, 3½ cents per 1000 feet; cost of works, $500,000.

Hanlon and Lindley Process.—Candle power, 22; carbonic oxide, 24½ per cent.; price per 1000 feet, 37 cents; royalties, 2½ cents per 1000 feet; cost of works, $275,000.

Springer Process.—Candle power, 22; carbonic oxide, 25 per cent.; price per 1000 feet, 42 cents; royalties, 2½ cents per 1000 feet; cost of works, $465,000.

I have not been able to find out whether one of these offers was accepted.

Prices paid for Material.

Tenders for Coal accepted Dec. 27, 1888—

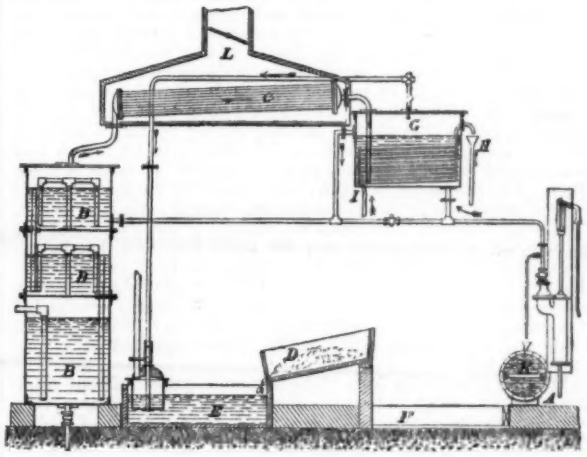
	Tons.	Price per Ton.
Manor Gas Coal Co.	5,000	$3·81
Penn Gas Coal Co.	57,720	3·82
Westmoreland Coal Co.	57,720	3·82
Newburg (Orrell) Coal and Coke Co.	15,000	3·76
James Boyce	15,000	3·76
Despard Coal Company	10,000	3·76
J. and W. Wood	10,000	3·76
Chesapeake and Ohio (C. B. Orcott)	25,000	3·80
Total	195,000	

Tank	$58,420·70
Holder	$46,820
Meter	$4500
Pig lead	$4·17 per cwt.
4-inch pipes	22½ cents per foot
8-inch pipes	47 cents per foot
8-inch specials	$2·48 per cwt.
12-inch pipes	85 cents per foot
12-inch specials	2½ cents per lb.
20-inch pipes	$1·66 per foot.
20-inch specials	2½ cent. per lb.

The tar contract was let for 21½ cents per ton of coal carbonized for three years from June, 1888.

THE CONCENTRATION OF AMMONIACAL LIQUOR.

At the Meeting of the Société Technique du Gaz en France held in Paris in 1886, M. Chevalet described an apparatus he had designed for the concentration of ammoniacal liquor, without the use of sulphuric acid, and the production therefrom of a material suitable for use, alone or in combination with other manures, as a fertilizer. At the then low price of sulphate of ammonia, the suppression of a very important item of expenditure naturally commended the apparatus to the notice of those gas managers who were struggling to make the most of their residuals in face of a very depressed market. Although things have somewhat improved, attention is still being directed to the apparatus, as affording managers of small works facilities for treating their liquor inexpensively, and producing therewith a manure of some value in agriculture. At the meeting of the above named Society at Boulogne last year, M. Chevalet brought the matter again before his colleagues, and described his method of proceeding. His remarks were briefly summarized in our abstract of the papers read on that occasion; but the subject was considered of sufficient importance to justify the more extended notice given to it in the JOURNAL for Feb. 5 last (p. 244). Since that article appeared, inquiries have been received from several correspondents concerning the apparatus; a simple plant for profitably dealing with the liquor produced in small works, being, it seems, a *desideratum*. In view of these inquiries, we give an illustration, reduced from the plate in the *Compte Rendu* of the Société Technique for 1886, showing M. Chevalet's arrangement, with a short description obtained from the same source.



It will be seen that the appliance consists essentially of a saturator G, a still B, and a cooler C (the last named being placed in an exhaust chimney L). The crude liquor enters at A, and is pumped into the saturator, whence it issues by an overflow-pipe, and passes into the still, where it parts with all its carbonate and hydro-sulphate of ammonia. From the still it passes into a boiler heated by a naked fire, where it is submitted to the action of milk of lime which decomposes the fixed ammoniacal salts. When the liquor in the condenser becomes too hot, it is cooled by a stream of water admitted by the pipe I, and, traversing the worm-pipe, passing out at H. As soon as the liquor from the saturator is sufficiently concentrated, it is drawn off into a cask K, made of either wood or sheet iron; the latter material being preferred, for the reason that if any crystallization takes place, the crystals can easily be dissolved, and the liquor recovered, by plunging the cask into a tank or reservoir of hot water. The gases or vapours given off during the process are led into a small acid trough E, which retains whatever ammonia may have passed from the saturator, or into a small scrubber supplied with a spray of cold water. D is the drainer, and F the sulphate drying-floor. With regard to the uncondensable gases, which consist principally of carbonic and hydrosulphuric acid, they are conveyed under the boiler furnace, so that they may be burnt and their disagreeable odour destroyed.

The concentrated liquor is of 18° to 20° Beaumé, or from 1·134 to 1·152 specific gravity; but instead of containing only about 14 or 15 per cent. of ammonia, as in the case of ordinary concentrated liquor, it contains from 25 to 26 per cent., or about as much as the dry sulphate. The product is liquid in spring; but in winter it crystallizes in the receptacles in which it is stored. By drawing off the mother-liquor, a product showing on analysis from 27 to 28

per cent. of ammonia is obtained. It is therefore in this respect equal in value to sulphate; and, of course, it is liable to the same expenses of carriage. But it possesses this advantage over the salt, that it can be produced wherever there is ammoniacal liquor to be treated. It has this drawback, however, as compared with sulphate, that thoroughly sound casks are necessary for its transport, and consequently the cost of carriage is augmented by reason of the additional weight. It may be asked how it happens that this product, while equal in density to those obtained by other appliances now in use, contains a higher percentage of ammonia. It is simply because it has in its composition less carbonic and hydro-sulphuric acid than is to be found in the other products; and, furthermore, it contains 13·8 grammes (about 213 grains) of ammonia per degree Beaumé per litre (0·22 gallon).

The advantage of this system of concentration may be said to be, in the first place, that it yields a marketable product; secondly, that it reduces 220 gallons of liquor of 1·02 specific gravity to rather more than 15 gallons of 1·152 specific gravity, or to about 1-15th of its former bulk. Therefore, in the case of works carbonizing 1000 tons of coal, there would be produced, by good washing in a well-fitted scrubber, about 22,000 gallons of liquor, which by concentration to 1·152 specific gravity would be reduced to about 1520 gallons. These results should merit the attention of those managers who experience any difficulty in disposing of their ammoniacal liquor.

NORTH BRITISH ASSOCIATION OF GAS MANAGERS.

The Papers and Discussions.

A RETORT-SETTING FOR SMALL GAS-WORKS.

By Mr. Adam MacPherson, of Kirkcaldy.

The subject I purpose bringing before you to-day is one which in recent years has been prominently brought before our meetings by managers of small gas-works, who, since the introduction of regenerative ovens for larger works, have shown a laudable desire to so improve the present methods adopted in such, as to participate at least to some extent in the benefits which have been found to result from the improved regenerative settings; while, at the same time, having an eye to the sometimes scanty means at their disposal, they have been anxious to secure this by as simple a means as possible, so as not to burden themselves with a heavy expenditure. I think it is needless for me to say this desire on their part has had our sympathy and support; and having been during last summer called upon to renew and remodel the retort-bench of the Dysart Gas-Works, I resolved to, if possible, elaborate a plan by which some of the savings resulting from regular regenerative settings might be secured without incurring any excessive expenditure. Being aware of all that had been done in the way of trying to improve the ordinary setting by Mr. Watson, of Stirling, and Mr. Yuill, of Alloa, and having given what they had done careful study, I resolved to go somewhat on some of their lines. I do not therefore claim entire originality for the setting, as I shall endeavour by the aid of the drawings to explain it to you. One thing, however, I do claim as original, is the passing of the primary air of combustion over the main flue, and thereby recovering some of what would otherwise be heat entirely lost. This, in the present instance, is no doubt accomplished in a very simple and perhaps crude way; but from the results obtained, I am satisfied it is a principle which would repay further careful study and elaboration, which might be accomplished at a very moderate cost.

You will observe the form of the furnace is quite different from the ordinary setting, in that the furnace bars are placed at a very considerable angle, whereby a very much greater depth of fuel is obtained; and it is of such capacity as to hold sufficient fuel to last for three hours, which of itself is a considerable saving of labour to the stoker, as well as preserving the heat of the oven and protecting the retorts from the injurious effects of the rush of cold air through the setting every time the furnace door is opened for firing purposes. You will also see that although for economy's sake the old furnace doors and frames have been used, these are not used for the purpose of supplying fuel to the furnace, but are made air tight, and only used once in twelve hours, to permit of the small quantity of ash which it has been found expedient to remove at such intervals, being raked out, which can be accomplished in the space of a few minutes, the operation being very easily done, as there is no clinker. A clinker bar is never used; and I may say, except in the very busiest time in the winter months, it is found sufficient to clean the furnace thoroughly out every twenty-four hours only. The fuel for the supply of the furnace is passed in through the opening between the two lower retorts, into which, with the aid of a small hopper, the hot coke from the top retort is passed; and, as I said before, the furnace being of sufficient capacity to hold fuel to last three hours, this is done every time the retort is drawn Should the charge drawn from this retort not be enough, a few shovelfuls from one of the others can be thrown in through the hopper to supplement it.

I would now wish to draw your attention to the method adopted to supply the necessary air for combustion to the furnace. It is first admitted into the space formed over the main flue, as shown in the drawing, and is drawn along this space. In its passage it will doubtless pick up some of the heat from the arch forming the top of the main flue. It then passes down, and is led forward under the setting, and introduced to the space below the furnace by the openings shown. A steam-pipe is also introduced (of the form shown) immediately below the bars, with the effect of increasing the draught, preserving the bars, and keeping the furnace free from clinker. I will now point out how I introduce and heat what may be called a secondary air supply. The air is admitted below the flues by which the heated products of combustion pass to heat the bottoms of the lower retorts into flues specially constructed for it; and after passing backwards the whole length of the setting, is again brought forward and carried up the sides of the furnace, and passed into it just over the fuel, so as to be immediately brought into contact with the gases being evolved therefrom. These gases then pass on along the setting, through the openings at the back, and travel forward along the bottoms of the lower retorts; then back along the sides; again forward; again back; and are conducted then into the main flue—all as will be clearly understood by a reference to the drawings and the arrows thereon. I would also desire to direct your attention to the method I adopted of covering in the flues for the conducting of what might be termed the secondary air supply. I have, as you will see by the drawing, separated the flues over these not by a single cover but by a double cover, my reason for this being that, as is well known, covers when heated or cooled down, unless this is very carefully done, are apt to crack or fracture; and as I supposed these might be subjected to such influences as would bring about such a result, I thought that by having the double row of covers to better isolate the two set of flues, and prevent any communication being formed between them, which, of course, would be injurious, thinking it unlikely, if a fracture did take place, that both covers would fracture at the identically same place. At least I would say the chances are very much against such a thing taking place.

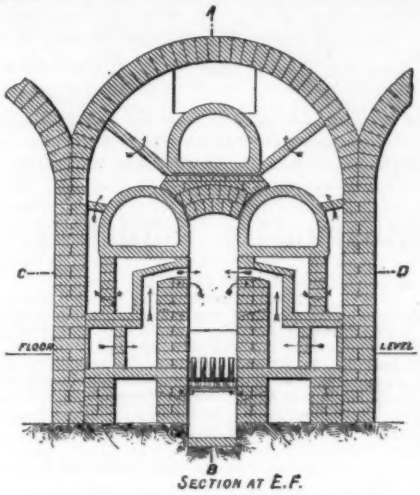
Having endeavoured to explain to you as clearly as I can the construction of the setting, I will now proceed to give you a few of the advantages which I claim for it, as have been brought out in actual working during the past winter. During the previous year with the old setting, it was found it required four hours to properly carbonize a charge of 2¼ cwts. per retort. This is accomplished by the new setting in 3 hours; and better done, the charge being thoroughly exhausted in that time, which was not always the case in the old setting even with four-hour charges. Here then has the productiveness of the setting been increased by 25 per cent., an improvement which by itself would fully justify its adoption. But then added to this we have an increased yield of gas per ton of coal of 1400 cubic feet, and a saving of fuel, even in obtaining such greatly improved results, amounting to one-third of what was previously required, to say nothing of the great ease to the stoker in saving him entirely from what certainly was before his most disagreeable and laborious work, in cleaning and clinkering the furnace, as well as the repeated filling thereof by the shovel. Besides the great conservation of heat experienced, where it is necessary (as it is at certain seasons of the year in numerous small gas-works) to damp down at night, to find in the morning that instead of having to draw the damper and proceed to clean and clinker the furnace, and then keep firing on for an hour or two before you can get the heat of your retorts into such a suitable condition as to justify you in charging them, you have only to draw your damper and proceed to put the charges into your retorts, after merely drawing a little ash out of the furnace; the heat of your retorts being very little if any worse than when you left them the previous evening, and certainly quite good enough to carbonize effectually the charge put into them. I think I may safely say that not only would its adoption be fully justified, but would be amply rewarded in the way most pleasing to gas managers in a very considerable increase of profits and a lessening of what we are all prepared to admit is somewhat laborious work for our men.

But now, I may be told this is not a regenerative setting. No, nor do I claim for it such a designation; but what I do claim is this, that whatever kind of a setting it may be designated, if it accomplishes the end for which it was intended, and which was, as I stated before, to enable managers of small works to achieve what they have for some years back been aiming at—to devise a setting which will be an improvement on the old method, and so enable them to participate in the benefits found to accrue from the higher and more equal temperature obtained by the adoption of truly regenerative settings—then my end has been accomplished. And although, if possible, we prefer to work on truly scientific principles, I do not think any of us would be justified in rejecting this or any other setting from which such advantages can be obtained, merely because the principles of construction do not accord with scientific theories. What is wanted is something to do the work, and that at as small an outlay, consistent with efficiency, as possible.

Discussion.

The President said that the subject brought forward by Mr. MacPherson was one which concerned managers of small works very much; and he hoped they would not be slow to express their views thereon. If any gentleman had been trying something of the kind of his own, or a modification of it, they would be glad to have his opinion.

Mr. W. Key (Tradeston, Glasgow) said he had some retort-settings on an angle very similar to Mr. MacPherson's. In the winter time, when they took on fresh hands, who were not accustomed to placing the fuel sufficiently well back, he tried these settings, in order that the men might put the coal on a level slope. In the Tradeston works there were three of these furnaces, which had been built on this slope, for at least ten years; and he had another retort (not at Tradeston)



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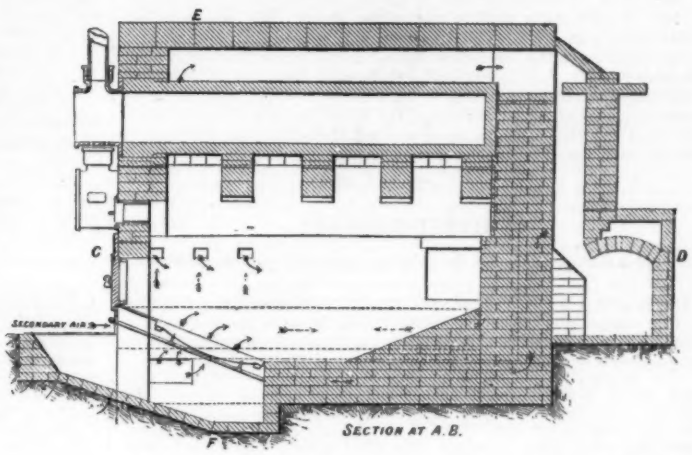

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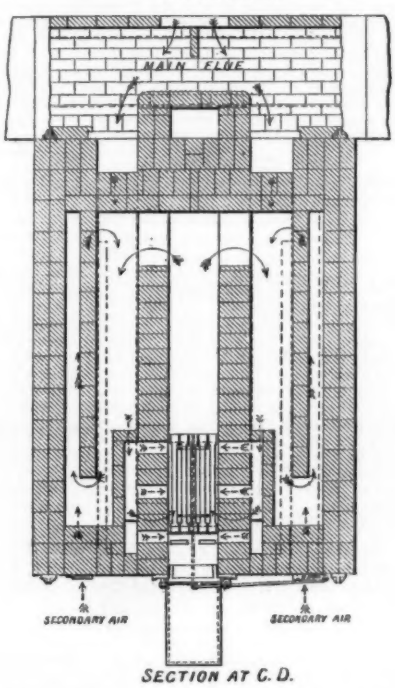


SECTION AT C.D.

with the same kind of door, where they could damp off in a similar way. It was a very great advantage; and certainly Mr. MacPherson had done well to introduce both these things. As to the heating of the air by the main flue before passing it through the fire-bars, a Mr. M'Ara, a lime burner of Glasgow, took out a patent at one time for a lime-kiln; and on consulting him, he advised that the air for the kiln, which was longitudinal, should be heated on the same principle as was shown on Mr. MacPherson's diagrams. The setting was as simple as it could possibly be; and he was not at all surprised that there should be considerable benefit by heating the air, as Mr. MacPherson had done, before admitting it to the furnace. Mr. MacPherson deserved credit for designing such a setting.

Mr. J. Hall (St. Andrews) was afraid they would not have much discussion on the paper probably, because the furnace was new; and they must accept Mr. MacPherson's explanations as to the benefit which accrued from using it. Looking at the drawings, he thought it was a very sensible setting. To him, one of its main recommendations was that it was simple; because if small gas-works were to be improved in these matters, unless the improvements were simple, they would not be effected. During the past two winters he had had a setting similar to the one shown, though with four retorts. He introduced two small flues at the bottom, below the flues which heated the bottom of the retorts. It went backward, came forward, and then went backward again, until it came to just about the farther end of the furnace bars. The benefit resulting from it was very marked indeed, not only in heating the retorts, but in simplifying the clearing of the bars; and his stokers, one and all, declared that it was a great advantage. It commended itself highly, he thought, to managers of works who might have difficulty in excavating deeply. He thought Mr. MacPherson deserved much credit, not only for his admirable paper, but for the drawings he had placed before them.

Mr. T. D. Hall (Montrose) agreed that they were certainly indebted to Mr. MacPherson for the trouble he had taken in preparing the paper, and for his excellent drawings showing the air-flues. He had really hit upon something new. He himself did not know much about regenerative furnaces; but in the drawings he had previously seen, he did not think there was any provision for heating the primary air supply. He thought Mr. MacPherson could really claim something new in that. He himself had put in flues under the furnace flues for heating the secondary, but not the primary air supply. With regard to the way in which Mr. MacPherson put his secondary air supply into the furnace, he would suggest—and perhaps Mr. MacPherson would give him his opinion on the subject—that the secondary air should be admitted to the furnace a little farther back; he would say immediately behind the furnace bars. This was where he admitted his secondary air; and he considered it to be the best place.

Mr. J. Hall said he thought there could be no doubt that the air passing through the flues before it reached the furnace was well heated.

Mr. A. Bell, jun. (Peebles), in the course of some remarks upon the paper, said they found no difficulty in melting a set of retorts in two months, after which they altered the admission of the secondary air, so as to allow the heat of the primary combustion to expend itself in doing useful work. Then, by bringing the products of combustion and the secondary air into contact, the consequence was that they obtained a very regular heat all over the furnace. Their experience bore out exactly what Mr. Foulis stated in his address to The Gas Institute two years ago—that it was necessary to cause the combustion to take place gradually, and not in one place. Mr. MacPherson would, perhaps, in his reply, say whether he had found any inconvenience in consequence of overheating at one place.

The President remarked that the subject before them was a very interesting one; and they were highly pleased to have a discussion upon it. There was no doubt that any modification that came short of the full system of regeneration must be acceptable to small gas companies. This, he thought, was such a system as must be interesting to all who managed small gas-works; and its "get-up" was exceedingly creditable. There were fears that the passage of cold air over the top of the main flue might fracture the retorts, and that then the whole of the air would be drawn right through into the main flue, instead of performing its purpose of primary combustion. Otherwise the arrangement was, to his mind, very good. It was somewhat similar to what had been done by their friend Mr. Bell, at Peebles. In his own system he found that exactly the same result took place—in a short time everything in the neighbourhood was run down. The plan now was to introduce the gases and the air together, so that they mixed in a complete manner; and by this means they obtained a uniform heat throughout the entire oven, which was a very important point. They were indebted to Mr. MacPherson for introducing this subject; and would be glad to hear what he had to say in reply.

Mr. MacPherson said that if Mr. Key had attended to what he had said, he would have seen that he did not claim originality for the slope of the bar. He was not aware of the application of the oven to lime-kilns; but in the paper he was only dealing with gas-ovens. With regard to what Mr. Bell had stated about heating, he might say his experience had not been the same. He found that the secondary air was introduced at the proper place. They could work with a very light draught; consequently there was no cutting action, and no extra heating took place round the nostrils, which might be expected, where the two gases joined, but nothing which could be called a destructive action. The slope of the furnace bar he put specially to get the depth of fuel, so that they might do without charging the furnace except when drawing the retorts.

Mr. Key: What is the vacuum in the combustion chamber?

Mr. MacPherson: I do not think we ever took the vacuum except by looking through the sight-hole, when we saw that the combustion took place very leisurely and lazily.

Mr. J. Hall: Do the two lower retorts burr?

Mr. MacPherson; No; we do not find that.

Mr. HALL: Then the bottom of the top retort is open to the heat?

Mr. MACPHERSON said it was, right along. He had not the least doubt that, by carrying the heat up first and then backwards, they might have the top retort heated better than the lower one. Replying to Mr. J. M'Nair (Wishaw), he said that to avoid reducing the heat it might be judicious to take a retort from each oven in drawing. To another gentleman who asked the percentage of coke required for the furnace, he answered that the yield of the top retort, with very little more, generally kept it going.

Correspondence.

[*We are not responsible for the opinions expressed by Correspondents.*]

INCREASED FACILITIES FOR THE CONSUMPTION OF GAS.

SIR,—Some time since I communicated, through the JOURNAL, a scheme having the above object in view; and your readers may perhaps be interested to know how we are succeeding.

The proposition was to fit up houses at the rateable value of £30 and under, with pipes and fittings and meter free of charge. The fittings to consist of stiff pendants and small brackets; and the meter to be a prepayment one. We find the average cost for each house, including everything, is under £4. The interest on the outlay is covered by a slight addition to the price charged for the gas. In our case, ordinary consumers pay 3s. 2d. per 1000 cubic feet; while under this system we charge 4½d. per 100 cubic feet, equalling 3s. 9d. per 1000 cubic feet.

I am able to say that we have met with greater success than anticipated. Without effort nearly 200 applications have come in within a short time; and the inspector who has this matter in hand reports that the whole thing is giving complete satisfaction. The meter in use is the one referred to in the JOURNAL for July 16 (p. 123). It consists of a stop applied to the dial of the ordinary index, so that any quantity of gas may be paid for in advance. When these are first fixed, payment is taken for not less than 400 cubic feet of gas, and the stop moved forward to that point. As these accounts are collected weekly, the inspector at the end of that time receives the money for the quantity that may have been consumed; moving the stop forward accordingly, and thus allowing what was paid for in the first instance to be always in hand. Should, however, a consumer fail to pay, when the ordinary pointer of the index reaches the stop the gas ceases to pass, and a further supply cannot be obtained until another payment is made. Of course, any desired quantity may be paid for in advance. If beyond 1000 cubic feet, the stop is fixed on the second dial; or it may be placed on the third one. It is therefore an easy matter to ensure a sufficient quantity being always in hand for use by the consumer; and for properties of the value named, this rarely exceeds 1000 cubic feet.

The unexpected favour with which this weekly system has been received, I think, points clearly to the fact that gas accounts should be collected more frequently—weekly or monthly instead of quarterly, which with the use of the stop-meter does away with the necessity for deposits.

At Ramsgate, the inspector has a certain number of houses to attend to and collect each day, and pays whatever he receives into the office at the end of the day. These amounts are kept in a separate book until the end of the quarter, when the indices are returned in the ordinary way, as a check on those returned weekly or monthly. The total for each house is then entered in the rental ledger.

The consumers under this system pay willingly and cheerfully; and up to the present time we have not had a single case of default.

WILLIAM A. VALON.

Ramsgate, Aug. 29, 1889.

A NOVEL SYSTEM OF AIR-FLUES FOR RETORT-SETTINGS.

SIR,—I have recently perfected a scheme for constructing regenerative furnaces which answers so effectively, and is so easy of construction, that I venture to recommend it to the attention of other gas engineers and managers.

Instead of allowing the cold air to enter the furnaces in the usual way, I close up the front by means of doors, so as to be air-tight. I form an air-flue over the top of the main flue, from near the entrance to the stack. The air supply has thus to traverse the length of the main flue and down the back of the arches, and under the bottom flues of the setting, finding its way into the furnaces by means of three port-holes on either side of the fire. The air at this point having become heated to a very high temperature, the result proves to be a saving of at least 20 per cent. of fuel. The retorts get much hotter; the heats keep more even; and in small works, where they damp down, the heat does not go back nearly so much.

If any of your readers would like further particulars, I should be pleased to answer any enquiries; or if any one feels disposed to see the principle at work and will visit these works, further particulars will be given with pleasure by me.

WALTER L. COPP.

Watchet, Somerset, Aug. 27, 1889.

OUTSIDE STOPCOCKS AND WASTE-WATER DETECTORS.

SIR,—May we add a few words to the discussion on waste-detecting meters. All the meter can do in practice, as "Another Night Inspector" points out, is to find the street in which waste occurs. Stopcocks to each house or a sound connector enable the waste to be quickly localized to the house where it occurs. Still, good results have been obtained by us in many towns with the "Waterphone," and without external stopcocks.

The mistake engineers are now making is in ordering a meter for each district, and fixing it permanently. One portable meter, in a box on wheels, producing a tape diagram, will be sufficient for small towns such as Leamington; and diagrams can be obtained with one meter in, say, fifteen districts quite quickly enough for any usual staff of waste inspectors to do their work. Why then do engineers spend a large sum on permanent plant in each district, and fix meters in most inconvenient positions, at great expense, when a pair of hydrants connected by a short length of hose with a portable meter when required will do all that is necessary.

J. TYLOR AND SONS.

2, *Newgate Street, E.C., Aug.* 31, 1889.

*** Another letter on this subject—from the Palatine Engineering Company, Limited, of Liverpool—was received yesterday, but too late to be published in to-day's JOURNAL. It will appear next week.

Parliamentary Intelligence.

HOUSE OF LORDS.

MONDAY, AUG. 26.

The Royal Assent (by Commission) was given to day to a number of Private Bills, among others the following:—Electric Lighting Provisional Orders (Nos. 2, 3, 4, and 5) Bills, Public Health (Scotland) Provisional Order (Linlithgow Water) Bill, Barry and Cadoxton Gas and Water Bill, Belgrano (Buenos Ayres) Gas Bill, Bury Corporation Bill, Cheltenham Improvement Bill, Garw Water Bill, Norwich Corporation Bill, Swansea Corporation Bill, Wigan Borough Extension Bill.

LONDON COUNTY COUNCIL (MONEY) (No. 2) BILL.

This Bill passed through Committee.

Lord DENMAN protested against the extravagant powers the Bill conferred on the County Council.

The Marquis of SALISBURY said he was not prepared to justify the Bill. It had been the practice for many years for the Government to accept Bills from the Metropolitan Board of Works, and to pass them on the responsibility of a department; and, in accordance with that precedent, the Government had done so now with a Bill of the London County Council. He was bound to admit that there were inconveniences in the practice; and in future years it would be better that the County Council should bear the responsibility for its own proposals.

The Bill was then reported without amendment.

FRIDAY, AUG. 30.

The Bribery (Public Bodies) Prevention Bill received to-day, with other public measures, the Royal Assent.

HOUSE OF COMMONS.

MONDAY, AUG. 26.

THE SUPPLY OF WATER TO THE FOUNTAINS IN TRAFALGAR SQUARE.

In answer to Mr. Kimber,

Sir H. MAXWELL said: The water supplied to the fountains in Trafalgar Square is not generally in a foul condition. The ordinary source of supply is from an artesian well at the back of the National Gallery; and the water used for the purpose is the condensed water (not bilge water) from the engines of the pumping station in Orange Street, which falls by gravitation to and from the fountains. But this supply is supplemented, whenever required, by water from the Chelsea Water Company's main. Water is supplied from the artesian well in question to the Royal palaces and public buildings in the West-end; and from repeated analyses, it has been found to be of excellent quality. It would not be economical to contract with the Water Companies for the supply required for the palaces or public offices; nor, if it were not so, would the water supply be purer than that obtained from the artesian well.

FRIDAY, AUG. 30.

The measure introduced by Lord Randolph Churchill, entitled the "Bribery (Public Bodies and Officers under the Crown) Prevention Bill," to-day received the Royal Assent.

AN ENGINEER'S FEES.—An action which Mr. G. A. Lundie, C.E., originally brought in the Queen's Bench Division against the Cadoxton Gas and Water Company for professional services rendered, was referred to Mr. James Mansergh, C.E., of Westminster. The plaintiff claimed £1000 Mr. Mansergh has just made his award; and he orders that the plaintiff shall receive £800, which sum includes £150 credited by the plaintiff and £250 paid into Court by the defendants. The defendants have to pay the plaintiff's costs of the action; and both parties pay their own costs of the reference and half the costs of the Referee's award.

THE ELECTRIC LIGHTING OF COWPEN.—No information has been received lately as to the lighting of Cowpen by electricity; but we now learn that the firm of electricians who contracted to supply the little township have already given a great deal of satisfaction. It is said that the only drawback to the light for street illuminating purposes is that it does not reach the back streets so well as might be desired, though even these "get some reflection from the light that is thrown on the principal thoroughfares." The Company have about eighteen lamps now in work; but a few more are required in certain parts. "The example set by the Cowpen Board in lighting up the township with electricity is one [says a contemporary], if the experiment does not prove too costly, that will possibly commend itself to other authorities in the district."

THE LOTHAMMER GAS COMPANY AND THE DISTRICT RAILWAY.—At the meeting of the first named Company on Friday, the 23rd ult. (a report of the proceedings at which appeared in our last issue) the Chairman, Colonel H. T. Murray, said that he had received a letter that morning in which it was stated that the District Railway Company had given their free consent to try the Lothammer gas at their Sloane Square station, with a view to its adoption throughout their system. Mr. Alfred Powell, the Manager of the Metropolitan District Railway, has since written to a financial contemporary, in respect to that statement, as follows:—"As this is a matter in which the public are concerned, I ask you kindly to allow me to state that the only letter I have any knowledge of is one from me, dated Aug. 20, and addressed to Mr. George White, of 17, Stowe Road, W., in reply to his application, on behalf of the Lothammer Company, to be allowed to make a trial experiment of this gas at one of our stations, and from which I make the following extracts: 'I am now prepared to afford you an opportunity of experimentally lighting our Sloane Square station by means of the Lothammer patent gas, if you will be good enough to write me a letter undertaking on behalf of your Company——' (Here follow certain conditions as to payment of expenses, &c.) 'Further, it must be quite understood the Company, by affording this permission, is not pledged in any way to adopt your system, either at Sloane Square station or elsewhere, whether the trial prove successful or otherwise.'"

Legal Intelligence.

MANCHESTER CITY POLICE COURT—FRIDAY, AUG. 30.
(*Before Mr.* F. J. HEADLAM, *Stipendiary, and a Bench of Magistrates.*)

MR. ELLIS LEVER AND THE MANCHESTER CORPORATION GAS COMMITTEE.

The summonses for libel issued against Mr. Ellis Lever at the instance of members of the Gas Committee of the Manchester Gas Committee came before their worships to-day. It will be remembered that the alleged libel was contained in a letter, marked "Private," sent by the defendant to the Mayor (Mr. Alderman Batty), who was absent when it was delivered at the Town Hall. The letter was opened by the Deputy Town Clerk (Mr. Talbot), and given to Sir John Harwood, the Deputy-Mayor, who brought it before the notice of the City Council. It was as follows:—

Colwyn Bay, June 7, 1889.

The Worshipful the Mayor of Manchester.

Dear Sir,—Before any of the contracts for coal and cannel are confirmed by the City Council, I wish, with your permission, to make a statement in reference to the dealings of the Gas Committee, and especially of certain members of it whose connection with at least one contractor is not of a character calculated to benefit the ratepayers nor fair to other contractors. It is quite time that the Council should know what has been going on for some time, and how my firm has been treated by the Gas Committee.—Yours faithfully,

ELLIS LEVER.

The summonses were taken out against Mr. Lever by Alderman Sir John Harwood, Alderman Asquith, Alderman Livesley, Messrs. Hinchliffe, Gibson, Clay, Chesters-Thompson, Brooks, Pingstone, Mainwaring, Sherratt, Milling, and Murray. The case was fixed for eleven o'clock; but a delay of over half an hour was caused by the non-appearance (afterwards explained) of Mr. Lever.

Dr. BLAKE ODGERS appeared for the Corporation; Mr. ADDISON, Q.C., M.P., for Mr. Lever.

After Mr. Lever entered the Court, a long consultation ensued between Counsel, during which Mr. Addison asked Mr. Lever to prepare a cheque for £300. As the conference was evidently in the direction of a settlement of the case, Mr. Headlam retired for a few minutes from the Court, and when he returned shortly afterwards the terms of the settlement appeared to have been agreed upon.

Dr. BLAKE ODGERS rose and said he was extremely sorry that there should have been any delay in opening the proceedings before the Court; but the time had not been wasted. It had apparently appeared somewhat disrespectful to the Court that Mr. Addison, who appeared for Mr. Lever, the defendant, and himself, should not have arranged the preliminaries before they came into Court. But there was an unfortunate misunderstanding. He (Dr. Odgers) was in one room and Mr. Addison was in another; and they were not able, by that slight misunderstanding, to approach one another as promptly as they might have done. He appeared on behalf of the Gas Committee of the Corporation of Manchester, and was present to prosecute Mr. Lever for a libel which he wrote on the 7th of June last, and sent to his Worship the Mayor. [Dr. Odgers read to the Bench the letter containing the libel.] This letter was written by Mr. Ellis Lever, a large contractor, and a contractor for the Corporation—a man in constant communication with the Gas Committee—a man who must have known who were the gentlemen he attacked in that letter. He must have known that they were of honourable standing in the city. Many of them were justices of the peace, and sat on the same bench occasionally with the gentleman on the bench at that moment; and they were all men who were elected by the ratepayers of the city of Manchester, and all of them were men having the confidence of the ratepayers of the city. Mr. Ellis Lever was a gentleman who, even at the present moment, had a large contract with the Gas Committee. He had supplied them with coal and cannel for a great number of years; and he must have been aware of the large business they carried on. They conducted their business in the most careful, he might say in an irreproachable manner. Shortly before this letter was written they had advertised for tenders for coal and cannel. Several tenders were sent in to them, and amongst others that of their old friend the defendant. But the Gas Committee of the Corporation could not show favouritism to any particular contractor. They had the samples of coal analyzed, and put through certain tests, and certain processes were gone through by men trained in the work, who recommended to the Gas Committee that all the tenders under a certain figure should be accepted, and all above rejected. It so happened that in this case—it had not been so in previous years—Mr. Lever's figure was a little above that which had been fixed upon by the Gas Committee; and it was therefore rejected. That fact was communicated to Mr. Ellis Lever's clerk; and on June 7, Mr. Lever, having been informed, it was presumed, that his tender had been rejected, sat down and wrote this letter—a hasty and ill-considered letter. Why should he quarrel with those with whom he had been on good terms for a number of years? Well, what were the Corporation to do in view of this letter? It distinctly charged certain members of the Gas Committee with having a connection with at least one contractor, which connection was "not of a character calculated to benefit the ratepayers nor fair to other contractors." The Magistrates knew as well as he (the learned Counsel) did that there had been in an adjoining borough not very long ago what was called a "gas scandal;" and up to the present time the people in the district had been talking about gas scandals and mismanagement by Gas Committees, not only in Salford but in other large towns. The air was full of suggestions that gas committees were not immaculate. At another time it might have been better for the Gas Committee to take no notice of the letter; but coming at a time when the public mind was aroused to suspicion of gas managers and gas committees the Committee thought it was a matter of which some notice ought to be taken. Accordingly the matter was taken up by the Gas Committee; and Mr. Lever was requested to prove his charge. He had not done so; and consequently the matter was brought before him (Dr. Odgers) for his opinion. He read the letter; and he advised the Gas Committee that, in his opinion, it was a libel upon them, and, moreover, a libel of which they were bound to take some notice. Then it was left to him to advise as to what proceedings ought to be taken. He advised that the case was one for criminal and not for civil proceedings. It appeared to him that they would get more speedily to an absolute retractation of these charges or proof of them if criminal proceedings were commenced; but the governing matter, to his mind, was this—that this was distinctly a public charge, made against public men in the execution of their duty; and it was therefore not a matter in which private individuals should put damages into their own pockets. His advice on this point had been criticised in the public press; and it had been said that it would have been very much better if civil proceedings had been taken; because in criminal proceedings the mouth of the defendant was closed. This had been freely stated; but there was really no ground for it, as under the Act for the amendment of the law of libel, which was recently passed, the person charged with libel was "a competent but not a compellable witness" at every stage of the hearing of the case. Therefore, if this matter had gone to trial, it would have been as open for the defendant to have gone into the witness-box as it would have been if civil proceedings had been taken. These proceedings having been taken, he had been approached by his friend, Mr. Addison. He thought Mr. Addison was as satisfied as he was that there was no ground whatever for the imputations cast on the Gas Committee; and accordingly he (Dr. Odgers) felt that it was not sufficient that Mr. Lever should be merely brought before the Magistrates and allowed to retract and apologise. The members of the Gas Committee had felt it desirable that he should do something more in order to show that he was in earnest; and he had insisted on this—and it was this that had caused the delay, for which he again apologised to the Court—he had insisted on Mr. Lever making some handsome donation to the Hospital Fund to show that he realized the position he had placed himself in. An apology had now been signed by Mr. Lever and handed to him; and he had better read it at once:—

I hereby retract and withdraw, absolutely and without reservation, all charges whatsoever against the Gas Committee, or any member of it, made by me in my letter to the Mayor, dated the 7th of June, 1889. I am satisfied that there never was any foundation whatever for any imputation conveyed by that letter. I now tender to these gentlemen my sincere apologies. I hereby agree to pay £150 for costs and £150 to the Manchester Hospital Fund; and I trust such payment, together with this apology, will be accepted as a sufficient expression of my sincere regret that the letter was ever written, and as the best amends it is in my power to make for what I have done.

ELLIS LEVER.

Not only had Mr. Lever signed that, but he had handed to the complainants a cheque for £300, and that being so Mr. Addison would make a few remarks upon the subject, and then, if the Court approved, he hoped to have from them some expression as to whether they favoured the course he (Dr. Odgers) proposed to take, which was to withdraw the summonses, so that the matter might be amicably settled.

Mr. ADDISON said, when a gentleman, to whom he was sure the Corporation would give credit for good intentions, felt that he was in the wrong, the best thing he could do was to say so, to withdraw in the best way he could, and to make amends in as straightforward and full a manner as it was possible to do it. He (Mr. Addison) had been very glad to approach his friend Dr. Blake Odgers in a course of action which he was sure would meet with the sanction of the Bench. Dr. Odgers had said of the letter in question that it was a hasty and ill-considered letter; and he (Mr. Addison) was quite ready to adopt that expression of his learned friend. Mr. Lever had been described by Dr. Odgers as an old friend of the Corporation; and Mr. Lever finding that for some time he had not been successful in getting contracts, and that they had been refused, he did, he dared say, being impulsive, and under circumstances of irritation, and with the feeling that many people had when others were preferred to them, or when the goods of other people were preferred to theirs, feel that there must be some extraordinary favouritism somewhere, or they would succeed as well as, or better than other people. Now that was not an unnatural feeling, and he thought they had all shared it at times, when other people had been more successful than themselves—though, perhaps, they had not been as unwise as Mr. Lever in writing the letter complained of. As a matter of fact, Mr. Lever did not himself write it. Somebody wrote it for him at night, when he was hurried; and no doubt if he had waited until the morning, he would never have written the letter at all. The letter spoke for itself, and no intention of Mr. Lever could alter what it said; but it was never intended to impute the smallest vestige of corruption to the Gas Committee, but only to suggest what was rather in the nature of favouritism, and that suggestion of favouritism arose from the sort of feeling which he (Mr. Addison) had indicated. That being so, Mr. Lever had already, more than once, he thought, been anxious to withdraw the letter. The Corporation, however, felt it their duty, under advice, and considering the peculiar circumstances of the present time, not to accept the withdrawal, but to bring the matter into a public Court; and in that course they had acted under the advice of Dr. Odgers. Dr. Odgers had vindicated that advice to the Court; and he (Mr. Addison) might be allowed to say he should, in his learned friend's position, have advised precisely the same procedure. Undoubtedly it was a very important matter indeed. It was of great public importance that there should be no suspicion of favouritism of any kind in connection with these important contracts, paid for out of the ratepayers' money; and Dr. Odgers, in pointing out that it was a public matter, and one for a public and serious investigation in a criminal court, gave sound advice. He had pointed to a recent Act of Parliament whereby now defendants were able to give evidence. That Act of Parliament was also intended very much to relieve newspapers, though he was bound to say it did not go quite so far as he should have liked in that direction. His friend under the circumstances could not but advise the Corporation to institute these proceedings; but at the same time he indicated that the Corporation themselves had not the slightest personal feeling towards Mr. Lever, whom he regarded in the light of an old friend. Mr. Lever explained that this was an impulsive, a rash, and a not very wise letter, and one which he regretted having written; and he (Mr. Addison) hoped—that being so—that the members of the Corporation would continue towards Mr. Lever in the future that good feeling which he had enjoyed in the past. As regarded the conduct of the Gas Committee, his learned friend had said that they were a body of irreproachable men carrying on their business as one would expect from such a body; and, indeed, it was hardly necessary to say that to those who knew them. But he quite realized also the full force of what his learned friend had said, that in these times, even against the best of them, people were apt to believe almost anything that was said, or to believe that there was something in what might be said; and that after the recent gas scandals they had heard so much about, and the excitement that had attended the subject in connection with other corporations, the Manchester Gas Committee could hardly look over this matter. This was an observation which he quite admitted; but he said that no personal imputation of any kind was intended to rest upon any gentleman of the Committee, of which they were proud to know Sir John Harwood was Chairman. He had had more than once—having to look at the matter, and having had occasion to have some acquaintance with the way in which the work of the ratepayers was being done by the Corporation—not merely to express his unqualified admiration of the honesty and integrity with which they conducted their business, but of the very great skill and very great labour which they bestowed upon that work. His friend had said that they were elected by the ratepayers, and he was convinced—indeed, he had often felt—that the ratepayers themselves hardly sufficiently appreciated the great amount of hard and anxious work that was done gratuitously by their servants. He was convinced that nobody who knew the Gas Committee and knew their Chairman could have more than one opinion upon the matter. Now his learned friend had said that there were disputes about the contracts; but he (Mr. Addison) thought it hardly necessary to say that they were never anything but mere trade disputes. Mr. Lever at the present time, under other contracts, was supplying the Corporation with coal. He hoped that under the circumstances, now that Mr. Lever had done all that was in his

power to express and to show his regret for this very unwise and very injudicious letter—for which he had apologised over and over again—that the members of the Corporation would continue to extend to him the good feeling which he (Mr. Addison) felt sure those proceedings had only temporarily interrupted; and that the Court might never hear anything more of Mr. Lever or the Corporation, or, if they did, that it might be only as to the good terms on which they were. He had only now to say that he was very glad to have been, with his friend Dr. Odgers, the means, so far as they could, of settling the matter, and to have had the opportunity of expressing his belief that the Gas Committee and the Corporation transacted their business in a way that was highly creditable to them, and for which they deserved great credit from the ratepayers.

After consultation with the other Magistrates,

Mr. HEADLAM said: I think the Bench are justified in allowing these summonses to be withdrawn. There is no doubt that this letter conveys a serious libel on the Gas Committee of the Corporation. Under all the circumstances, and in view of what has taken place in a neighbouring borough, the Committee are quite right in calling upon the defendant, in summoning him here and calling upon him to plead, if he can, justification. As, however, the defendant has retracted fully what he has said in the letter, as he does not intend to impute any charge against the Gas Committee, as the letter was written in haste and under a hasty impulse, as he has paid the costs in this case and also something to the Hospital Fund—although I think it is rather a small sum for him to pay—and as the Corporation and the Gas Committee are satisfied, I think we shall be justified in allowing these summonses to be withdrawn.

Mr. Lever's Solicitors (Messrs. Denny and Paterson) have addressed the following letter to the Manchester press in reference to the delay which was caused by the non-appearance of Mr. Ellis Lever at the Court at the appointed time on Friday:—"With regard to some remarks which were made in Court this morning respecting the absence of Mr. Lever when the case was called on, we think it right to state that it was by direction of his Counsel (Mr. Addison) that Mr. Lever remained at the Grand Hotel till he was sent for. The conference which took place between Counsel prior to the hearing of the case lasted longer than was expected, and immediately it was over a cab was sent to the Grand Hotel and Mr. Lever returned in it to the Court without a moment's delay. It will thus be seen that Mr. Lever is in no way to blame for his non-appearance in Court when his name was called."

ELECTRIC LIGHTING IN NEWCASTLE.—It is announced that the factory and plant of the Newcastle-on-Tyne Electric Supply Company are quite complete, and electric lighting will, so far as this Company is concerned, probably be an established fact in the city in a few days.

THE SURPLUS PROFITS OF THE LANCASTER GAS DEPARTMENT.—The disposal of the surplus gas profits formed the subject of a discussion at the meeting of the Lancaster Town Council last Wednesday. Owing to the pressure on our space this week, we reserve our report of the various speakers' remarks until the next issue of the JOURNAL.

ANOTHER WATER GAS COMPANY.—A Company denominated the "Anglo-American Water Gas (B. van Steenbergh's Patents) Syndicate, Limited," has been registered with a capital of £10,000, in £5 shares, having for its object to acquire any inventions, patents, secret processes, or rights of any kind connected with the manufacture or use of water gas

FATAL PARAFFIN LAMP ACCIDENT.—A terrible lamp accident occurred on the morning of last Sunday week at a house in Glaucus Street, Bromley-by-Bow. John Honey and his wife, the occupants of the dwelling, had left a paraffin lamp burning during the night, and when Mrs. Honey attempted to extinguish it in the morning, the heated fumes from the oil exploded with great violence, and burst into flame. The woman was fearfully burnt about the body; and was taken to the London Hospital in great agony. Her husband was severely burned on the hands and arms in attempting to quench the flames; and he, too, was taken to the hospital. The unfortunate woman died the following day.

ELECTRIC LIGHTING FOR PRETORIA.—An esteemed correspondent sends a cutting from the *Cape Times* of July 19, giving particulars of another electric lighting scheme for South Africa; remarking that "the business of concessionaires and promoters seems a profitable one, and the ways of starting a company in that part of the world charming." The prospectus is that of the "De Zuid-Afrikaansche, Electriciteits Maatschappij, Bep. (the South African Electric Supply Company, Limited), Pretoria, S. A. Republic." The capital of the venture is £85,000, in £1 shares, divided as follows:—£17,000 in fully-paid shares to the concessionaire and promoters, £50,000 of working capital, and £18,000 of reserve shares. The whole of the £50,000 of working capital having been privately subscribed at par, no shares were offered to the public. The object for which the Company was formed is, *inter alia*, "for the purpose of purchasing and carrying out the objects of a concession granted by the Government of the Republic to J. Van Zwieten, Esq., dated the 1st of March, 1889, giving him and his assigns the sole right of supplying electric light and power in the town of Pretoria and its suburbs."

THE EIGHT-HOURS MOVEMENT AT BIRMINGHAM.—Last Sunday week a meeting of men employed at the Birmingham Corporation Gas-Works was held, at which it was resolved that a memorial should be sent to the Gas Committee, requesting the members to take into consideration the hours at present made by the men, with a view to the reduction of the same from twelve hours per day, or 72 per week, to eight hours per day, or 48 hours per week, and also for a reduction of work to 24 retorts per day. The memorialists say they may be told by some that this is a large request, and will considerably reduce the profits of the Gas Department. Even admitting that this be true, they assert that the question of a large profit should not be the primary or even the principal consideration of any governing body in its dealings with its *employés*. Corporate bodies they remind the Committee, are appointed to look after the welfare of the inhabitants of the district they are in charge of, and have therefore no right to compel men to perform tasks that are injurious to their physical and mental well-being. The memorial will be taken into consideration at the next meeting of the Gas Commitee, which, owing to the municipal vacation, and the absence from town of a number of the members, does not take place until the 23rd inst. Alderman Pollack (the Chairman of the Committee) is reported to have said that the memorial is likely to be favourably considered, and that there is every reason to anticipate that a re-arrangement of work may be effected to the mutual satisfaction of the Committee and the operatives. The alteration will entail an extra cost for wages of from £8000 to £10,000 per annum. The present wages at the works amount to about £35,000 a year. The Engineers have already been instructed to prepare reports upon the subject of re-organization of the labour at their works on the eight-hours' system, and the matter will be ripe for the consideration of the Committee on the re-assembling of the members.

Miscellaneous News.

THE SALFORD GAS SCANDAL.

SPECIAL MEETING OF THE COUNCIL.

In accordance with a requisition to the Mayor (Mr. Alderman A. L. Dickins), a Special Meeting of the Salford Town Council was held last Wednesday, to consider the resolutions of which notice had been given concerning the compact which the Consultative Committee of the Corporation had made with Hunter. These resolutions were given in the JOURNAL last week (p. 414). The MAYOR presided.

The MAYOR said they had met on the requisition of eight members of the Council to consider certain resolutions of which they had all received notice. He thought himself, and he felt sure that in this he carried with him all the right-minded members of the Council, that the public press had prejudiced to a great extent a matter which ought to have been brought before the Council first of all for adjudication. The newspapers had admitted into their columns statements which were totally untrue, had stated as facts things which were not facts at all, and had tried by every means to condemn members of that Council who had endeavoured to do their duty. It was very much to be deplored that the public press, to which they owed so much, and from which they received so much guidance in many matters, should have prejudged this matter, and written articles against members of the Council who were honourable men, and who endeavoured to the best of their ability to carry on the work of that great borough. He was not going to notice the sourrilous letters which had appeared in the local papers; but he proceeded to criticize an article which had appeared in the *City News*. A sum of £20,000, he said, was offered in relation to the criminal actions, and not in relation to the civil proceedings in any shape or form. Sir Charles Russell advised that in taking that sum they would be condoning a felony; but he clearly expressed to him (the Mayor) and to the Town Clerk his opinion that if that amount were offered in settlement of all claims the Corporation had against Hunter and the other persons interested, it should be accepted. That was the distinct opinion of Sir Charles Russell and other eminent men. Hunter's Solicitors, however, never thought proper during the whole of the time that elapsed to pay any money against the civil action. Doubtless they thought if they paid it, it might have no effect upon the sentence Hunter would receive; and therefore the whole thing lapsed. They would remember that Mr. Justice Hawkins deferred sentence for two or three consecutive sessions, to enable the prisoner to pay in regard to the civil action such sum as might be considered right and proper. But he did not do so. The consequence was that Hunter was sentenced, not, as the Council knew, for receiving commissions, but for forgery and also for perjury. For the former offence he received twelve months' imprisonment, and for the latter five years.

Mr. MANDLEY (interrupting): For obtaining money by false pretences.

The MAYOR: I wish you would not interrupt me; I do not interrupt you. The sentence was twelve months for the forgery and five years' for the perjury, and the sentences were to run concurrently.

Mr. MANDLEY: I rise to order. That is not the sentence, Mr. Mayor.

Alderman ROBINSON: Mr. Mandley has no right to call the chair to order.

Mr. MANDLEY: I rise to a point of order. I say the sentence was for obtaining money by false pretences.

The MAYOR (continuing) said that Hunter was sentenced; and for some time he made no advance in any shape or form towards paying anything in respect of the civil action, and therefore the matter was in abeyance for a long time. The Corporation were still proceeding with their different actions against those who had been the bribers in the gas frauds. Hunter having been sentenced, and feeling like most men when they were imprisoned, anxious to get out, in time began to make certain offers to the Consultative Committee who had been appointed by the Council for the purpose of dealing with the case. He offered to pay sums of money, beginning as low as £4000 and going up to £5000, £6000, and so on. During all that time they were proceeding with their actions, and pushing them forward as rapidly as could be. The Council, he might say, owed a debt of gratitude to the present Town Clerk for the assuidity with which he carried forward this unpleasant business. Ultimately £7000 was offered; but the Committee thought it desirable to see whether the civil action between the Corporation and Hunter and Hawkins only might be settled by obtaining the sum of £7000. They consulted a barrister (Mr. Maberley) upon it; and he wrote a reply, in which he said: "The sum offered is substantial. It is certain that if it is not accepted, and the action proceeded with against Hunter, little or nothing will be recovered from him; and if the contractors are to be sued to make up what Hunter cannot pay, the Corporation will be involved in a good deal of litigation, which must take time, and cause a good deal of expense, with the possibility of failure which is attendant upon almost all litigation. If I may say so, I consider that the Corporation, as a public body, would be fully justified, and would be acting wisely, in avoiding this litigation and in accepting the present offer, even if it involves a release of all claims, so as to close the matter once and for all." Sir Charles Russell and Mr. Maberley were of opinion that it was advisable that the transaction should be closed. But the Committee thought it desirable to go further; and they intimated to Hunter that the minimum sum they were prepared to receive was £10,000. Negotiations were opened between Hunter and his friends; but for a long time they came nowhere near that sum. Sums of £7500, £8500, and £9000 were offered. The Committee, however, were determined that they would remain firm to the sum of £10,000; and at last that offer was accepted by Hunter's Solicitors, and guarantees to that amount were placed to the credit of the Corporation in the bank. But Hunter did not offer the sum of £10,000. The Committee demanded it; and he paid it. Then came the question of the memorial or petition which had been signed. When the agreement as to the payment of the £10,000 was made between Hunter and the Corporation, it was concluded on the stipulation that there should be no conditions whatever attached. No conditions were asked by the defendant's Solicitors; and none were granted by the members of the Corporation, and those who signed the requisition. Another fact which people had not been sufficiently generous to give them credit for, was that the whole of this sum of £10,000, or securities representing it, were placed to the credit of the Mayor and Mr. Walker, the defendant's Solicitor, in the Lancashire and Yorkshire Bank, prior to any petition being presented. If not a single signature had been attached to the petition, the Salford Corporation would have been in exactly the same position as they were now—that was to say, that in December they would receive the sum of £10,000 in cash; and therefore the question of the petition had nothing whatever to do with the payment of the money. That, therefore, was not a question for their consideration. The sum of £10,000 had been paid; and as a business transaction, it was closed. Mr. Walker, anxious to do what he could for his client, then asked whether they would in their private capacity object to sign a petition praying that some part of Hunter's sentence should be remitted. Hunter,

as they knew, had already served twenty months' solitary confinement—a most severe sentence; and he (the Mayor) thought the quality of mercy would not be strained if a petition were signed for a remission, or at any rate an amelioration, of a part of the sentence which Hunter was now suffering, when it was considered that to all intents and purposes the offence for which he was sentenced was not a criminal one. He (the Mayor) signed the petition in his private capacity, and not as Mayor or as an Alderman of Salford; and if anyone, seeing his name first, had considered that quite sufficient for also signing it, he should be pleased to take the responsibility upon his own shoulders. (VOICES: "There is no need," and "Hear, hear.") The signing of the petition was simply an expression of the opinion of certain gentlemen. The petition would be dealt with by the Home Secretary in the usual way. If it was considered advisable to remit any part of the sentence, well and good; if not, the matter stood in exactly the same position as before. What had been done had been with the cognizance of the whole Consultative Committee, to whom had been delegated the duty of concluding this unhappy business. He contended that they had done their work well, and for the benefit of the Corporation and the ratepayers, and should have commendation rather than reproach. There was some talk of obtaining a Royal Commission to investigate the matter. They had almost had a Royal Commission amongst themselves when they appointed an Investigation Committee composed of the best intelligence of that chamber, and presided over by Mr. Alderman Walmsley. That Committee held 38 meetings, and presented two reports. The result had been of great advantage to the Corporation, because it had put the works of the Gas Committee on a different footing altogether; and the business had since been conducted better than ever before in the history of the Corporation. It would be far better, if they were to have a Royal Commission, that instead of inquiring into the gas frauds, it should inquire into the condition of some of the streets and wretched courts, and endeavour to find some means for alleviating the great distress which existed in many parts of Salford. Let members of the Council do the work before them in a straightforward manner, without uttering inuendoes against other members. Salford had recently risen to the dignity of a County Council; and the circle of her municipal government had been made complete by the creation of a Court of Quarter Sessions. Let members consult their own dignity and maintain the dignity of the borough.

Aldermen KEEVNEY directed attention to what was described as a question of privilege. He said there had been in the newspapers a great deal of personal attack upon "the Pendleton Cathedral," as some people were pleased to call it, because Samuel Hunter worshipped there during a portion of the time he was in Salford. The whole letter was full of untruths.

Mr. MANDLEY asked that the letter might be read.

Alderman KEEVNEY said the letter was as follows:—

Sir,—I have heard nothing further of interest *re* the Hunter compact, save that a strong effort will be made to defeat all three of the resolutions to be moved next Wednesday. My belief is that some members of the Council have unwittingly partaken of Hunter's hospitality, or of that of some of our contractors, and that fact they may fear will leak out, *vide* a letter in to-day's *Courier*, which reads like a hint to some of them. There was one trip to the "Holy Land" that has often been spoken of, but that occurred many years ago. I wrote a letter to the *Guardian* to-day, of which I sent your paper press copy. Mr. Ashton was a neighbour and fellow "worshipper" with Hunter. Hunter was the heaviest subscriber to the new "Wesleyan Cathedral" (Brunswick Chapel, Pendleton).

Now that was a lie.

Mr. MANDLEY objected to the use of the word "lie."

The MAYOR agreed that the word should not be used. The expression 'misstatement" or "devoid of truth" would have done quite as well.

Alderman KEEVNEY proceeded to say that there was no ground for Mr. Mandley's statement, and to prove that that was so, he handed to the Town Clerk an official statement of the subscriptions received by the Trustees of the chapel.

Mr. MANDLEY: May I be allowed to see it?

Alderman KEEVNEY: No, sir. I submit it to the Mayor and Town Clerk. It is an official statement by the Trustees.

Mr. MANDLEY said he wished to see the names, to find how many of the subscribers were contractors for materials supplied to the gas-works.

The MAYOR observed that Mr. Mandley had no right to see the list; but he might state that Hunter's name was only second on the list.

Alderman KEEVNEY said the list did not contain the name of a single contractor; and he maintained that those statements were made to deceive the people of Manchester and Salford. Mr. Mandley further said in his letter: "There was a great rivalry between Hunter and Alderman P. Keevney *re* this chapel. Keevney was, up to about six months before the trial of Mr. Lever, a most infatuated admirer and an ardent defender of Hunter, but his conversion was extraordinarily sudden, and then he denounced him far more bitterly than I have ever done." The statement with reference to him being an "infatuated admirer" of Mr. Hunter till six months before the trial was wholly inaccurate, and was made with the intention of deceiving the public. A man who could write such a letter was unworthy of belief in that Council.

Mr. MANDLEY said he thought it right to state in the first place that he had sent no such letter for publication in the *Manchester Examiner and Times*. On the day he penned those remarks very hastily indeed, one of his clerks told him that a clerk had called from the *Examiner and Times* office to know if he (Mr. Mandley) could tell him anything in reference to the Hunter settlement. He then wrote the lines in question; but they were not directed to the editor of that journal, but to a gentleman in the office of the newspaper. He had not the faintest conception that the letter would be published. He simply mentioned that because, had his letter been intended for publication, it would have been more courteously worded.

Alderman KEEVNEY: It bears your signature.

Mr. MANDLEY: Oh, that is nothing.

The MAYOR: The letter is addressed "To the Editor of the *Examiner and Times*, Sir." Have they put these words in without your authority?

Mr. MANDLEY said they had done so without his authority. The very tenor of the letter showed that it was not intended for publication. It was simply sent to guide the editor, and not for publication. On other occasions he (Mr. Mandley) had referred to Hunter having contributed largely to the construction of the chapel in Pendleton.

The MAYOR said that before the discussion proceeded, he would like to add to his previous remarks (perhaps in what he had said he had not made it quite clear) that Hunter was imprisoned for a criminal offence, but not against the Corporation.

Mr. MANDLEY said part of the sentence was for obtaining money by false pretences.

The MAYOR, referring to the speech of Mr. Justice Hawkins in passing sentence, said it was as Mr. Mandley had stated. Twelve months of the sentence was for obtaining money by false pretences, but not from the Corporation.

Mr. STEPHENS moved—"That this Council has learned with profound regret that a petition signed by certain leading members of this Council, and purporting to be 'signed by nearly every member of the Salford Corporation,' has been forwarded to the Home Secretary on behalf of Samuel Hunter, and hereby records its entire disapproval of the said petition, and emphatically repudiates the action of the said members in signing the same." In moving this resolution, he said that it was not necessary he should detain the members very long. The chief question was as to the probable effect of the petition to the Home Secretary; and he thought the probable effect would be that he would say: "These men who sign the petition are the old masters of Samuel Hunter; something has happened since Samuel Hunter was imprisoned which has brought about an alteration in their minds; and they are anxious to remit the remainder of the sentence." That being so, the question was whether the petition was genuine—whether it was what it pretended to be. It pretended to be an expression of the opinion of nearly every member of the Salford Council and of the largest ratepayers of the borough, and in reality it was nothing of the kind. Two-thirds of the members of the Council had not signed the petition. What he desired was that the Home Secretary should know that the Council and the public would not be parties to a bargain of this sort—that for £10,000 they would try to get behind the law. The Home Secretary should also know that the movement was not general and spontaneous, as he might otherwise be led to believe it was. The action which had been taken was the action of a few; and it was an action in which secrecy, whether intentional or otherwise, seemed to be the order of the day. (A VOICE: "Nothing of the kind.") If the signatures to the petition were given without the knowledge of what the signatures implied, he would moderate the severity of what he had to say. If those who signed it did so knowing what it implied, the thing would be an outrage on common decency, and such men should be swept root and branch out of the Council. He was chiefly anxious that the public and the Home Secretary should not be misled as to the real position of matters. If the terms of the petition were allowed to go uncontradicted, he felt that Salford would have dropped back into the quagmire once again. Whatever else they did, let them send it forth unambiguously that the Council would have none of a bargain in which £10,000 was on one side and a petition for the release of Hunter on the other.

The MAYOR: It is not so. That has been contradicted already.

Mr. HEWITT seconded the motion, and said what was desired was to secure that the action of certain members of the Council should not be mistaken for the action of the Corporation. It should be made known that the action of those members of the Council was not acquiesced in by the majority of the members, or the bulk of the burgesses. In considering the question of the justification there was for the petition, no doubt they had feelings of pity for Hunter as a former servant of the Corporation. They should, however, remember that the sentence was not merely the punishment for a wrong act done by Hunter, but something which was intended to have a deterrent effect on others who were inclined to do as Hunter did.

Alderman WALMSLEY proposed the following amendment:—"That, in the opinion of this Council, the personal rights and privileges of municipal representatives are not fettered or curtailed by becoming members of the corporate body of any municipality; but that in their individual capacity they are free to exercise such rights in any way they think fit. And therefore this Council refuses to commit itself to so unconstitutional a course as to condemn the action of certain of its members who, in their private capacity, have signed any memorial or petition for some mitigation of the sentence passed on Samuel Hunter, which memorial was neither promoted nor sanctioned by this Council." He thought the resolution which Mr. Stephens had submitted could not be regarded in any other light than as a vote of censure upon certain individuals. Was it a logical resolution? and was this vote of censure to be passed upon 22 members of the Council as members of the Council or as private individuals? These members declared they had acted only in their private capacity; and if the Council passed a resolution condemning them for doing what they in their consciousness thought to be right, it would be an illogical resolution and a piece of arrogant presumption. No member of the Council had a right to dictate to another as to what he might do in his private capacity. If the vote of censure was proposed on them as members of the Council, he would ask them to hesitate before they branded their colleagues with anything so serious. The gentlemen who signed the petition had as much intelligence, as much honesty, as much regard for their own reputation and the reputation of the borough, as the gentlemen who were now, on very insufficient grounds, raising this matter. In considering the question of the justification for the petition, he directed attention to Mr. Justice Hawkins' remarks in passing sentence. Justice Hawkins said: "During the running of your sentence, you will be under the watchful eye and care of those who, knowing your state of health, will be anxious not to allow you to suffer one single hour's pain by reason of your physical infirmity and condition, other than that which you are able and fairly and reasonably ought to endure. I know also this, that if in the course of your confinement it should be thought necessary that other steps should be taken with a view to your release before the termination of your sentence, there is also an appeal which can be made to the Home Secretary to advise Her Majesty to remit any portion of the sentence which I am now about to pass, and which may remain unexpired; and you may rely upon this, that if the necessity should arise for making such an application, you will find no obstacle in me, supposing, of course, the Home Secretary himself thinks he should so advise Her Majesty." Mr. Justice Hawkins was not (continued Alderman Walmsley) a mild Judge—he was well known throughout the country to be a severe Judge; and if he could make such remarks at that early period, surely in what they had done now, the 22 members of the Council had not acted otherwise than in a very merciful and very proper manner. He thought that those who had by speeches and letters to the newspapers hounded on an impulsive multitude to come to a hasty and half-formed conclusion, had acted most unworthily. He thought the action of the newspapers in the matter could not be sufficiently condemned.

Alderman BOWES, in seconding the amendment, observed that he thought the statement made by the Mayor would satisfy every reasonable ratepayer that those who had signed the petition had acted in an honourable and straightforward manner.

Mr. ROPER said he was one of those who was prepared to accept the explanation that had been made—that the petition and the compromise were separate and distinct arrangements. He did not desire to say a wrong word against either the Consultative Committee or the gentlemen who had signed the petition, because he believed them to be honourable men acting from pure motives; but he thought they had been the subjects of a little sharp practice. The petition stated that it was signed by nearly every member of the Council, but there were only 22 who had signed it; and therefore that was a misstatement to begin with. They were also told distinctly in the petition that Hunter had met all the demands of the Corporation by giving £10,000, when, as the Council were aware, they demanded something like £22,000.

The MAYOR: We consented to receive £10,000.

Mr. ROPER said Hunter was sued for £22,000. If it could only be proved, he believed it would be found that Hunter had not paid a penny.

It was the men behind the scenes who had collected the money whom the Council desired to get at. They were the men who had bribed in the past, who were bribing to-day, and who would bribe in the future; and those were the persons they wished to make an example of in the attempt not only to purify the air of Salford, but of the country at large. It was strange that members of the Council who had signed the petition in their private capacity should have had their official titles added; and he thought that was a piece of sharp practice which should not have been resorted to in the case of honourable men.

Mr. JONES inquired whether Mr. Roper had any ground for the statement that Hunter had not paid a penny.

The MAYOR said that securities were now in the hands of the bank representing more than the sum they had demanded.

Mr. JONES: There is a distinct assertion that not a penny comes from Hunter.

Mr. ROPER: That is my assertion.

Mr. MIDDLEHURST observed that, when the petition was presented to him for signature, he asked whether it was promoted by members of the Council; and the answer was distinctly in the negative. He signed it in his private capacity, without any addition whatever. Other members of the Council appeared to have signed it in the same way; and he did not think they should be condemned for so doing. He held that the resolution was out of order, and should support the amendment.

Mr. GROVES remarked that he had been put down as having signed the petition; while he had never seen it. He asked whether the mover could not modify the resolution so as to express disapproval of the petition, and at the same time not put members of the Council under the necessity of passing a vote of censure upon their colleagues who had signed it. The amendment also did not meet his view.

Mr. BRADBURY said that as one of the "criminals," he did not ask for any alteration. He was not ashamed of the part he had taken in the matter.

Mr. MANDLEY expressed his desire that the amendment might be altered.

Alderman WALMSLEY said he was willing to alter it if Mr. Mandley would show him how it could be done.

Mr. MANDLEY said that Alderman Walmsley had made reference to the terms in which the sentence was passed upon Hunter, and to the scene which took place in the Central Criminal Court. Mr. Justice Hawkins, if a severe, was also an upright Judge; and he said that, having taken into consideration all the circumstances of the case, he had dealt leniently with the prisoner.

Mr. RYCROFT said there was one thing common to both the resolution and the amendment—viz., that the memorial which had been sent to the Home Secretary was not the act of the Corporation. He was sorry to find so much extraneous matter brought into the discussion. Much as he might differ from the gentlemen who had thought fit to sign the memorial, he did not say that they had not the right, in the exercise of their clemency, to entertain the view that Hunter had already expiated the crime of which he was convicted. That was a matter of opinion, and reasonable men might differ upon it. It had been asserted by the members of the Council who had signed the petition that they had done so in their private capacity; and they accepted that statement, but unfortunately the memorial itself was calculated to mislead. That being so, he thought the Council might be satisfied by passing a formal resolution asserting the fact that the Corporation was no party to the memorial.

Mr. W. H. COTTRELL thought the amendment might be so altered as to meet the views of all the members of the Council.

Two other amendments were handed in; but were ruled out of order. A division was then taken, when 28 votes were recorded for the amendment, and 14 against. The amendment was then put as the substantive resolution, and carried.

Mr. MANDLEY then proposed the following resolution:—"That the Town Clerk be and hereby is instructed to draw up for presentation on behalf of the Mayor and other members of the Corporation, an humble petition to Her Majesty's Government, praying that, in view of the confession made by one of the former servants of the Corporation, one Samuel Hunter, now a convict in one of Her Majesty's prisons, and also of the tacit admissions made by some of the many persons alleged to have been in collusion with the said Samuel Hunter to defraud the Corporation, and who, by means of money payments offered through the Solicitors or other agents of the said Samuel Hunter, are seeking to hush up their frauds, and to put a stop to the civil actions instituted against them by the Corporation, a Royal Commission be sent to this borough, to inquire into the whole matter of the alleged frauds in connection with the gas and any other department of the Corporation, covering a period of at least twenty years past. That the rough draft of such petition be laid before the Council for its approval before engrossing and signature." He wished to know why in the report of the Consultative Committee several firms mentioned as having had transactions with Hunter were not referred to. The Mayor had received a sum of money from a gentleman as conscience money; and he (Mr. Mandley) considered that it was necessary that the Council should know who that individual was. A Government inquiry alone could bring to light the names of persons who had supported Hunter. Men had refused to open their books, and others who had placed their books before the Council had only disclosed suspicious entries. The owners of these books ought to be compelled to disclose the meaning of the entries. He went on to refer to several matters which were made public in the course of the proceedings against Hunter; and said that in 1878, when it was moved that Hunter's salary should be advanced from £500 to £700 a year, he was practically entrusted with the spending of £180,000 on extension of works and renewal of plant, &c. That was a very large sum; and when they found that on one contract alone £2250 was divided between rogues, they might estimate the amount of money of which the ratepayers had been defrauded. The Gas Investigation Committee had obtained much useful information; but it was buried away somewhere, and was inaccessible to the Council or the ratepayers. The time had arrived when the whole matter should be probed to the bottom. The question was not merely one of commissions paid to Hunter. Inquiry ought to be made as to short weight in the deliveries of coal and cannel, as to the substitution of inferior qualities of cannel, and other matters.

Mr. ROPER, in seconding the resolution, remarked that he believed the appointment of a Royal Commission was the only means of sifting the whole business and getting rid of it once for all.

Alderman BAILEY moved as an amendment—"That this Council, having already, by the protracted labours of the Gas Investigation Committee, and the more recent inquiries of the Consultative Committee, obtained all the material information necessary to govern its future action in relation to the frauds committed by Samuel Hunter—frauds exposed and proved by trial at law, and made notorious by the broadcast publication of the same—decline to order the Town Clerk to prepare a petition to Her Majesty's Government praying for the appointment of a Royal Commission to inquire into alleged 'confessions' of Samuel Hunter and 'tacit admissions' stated to have been made by persons in collusion with Samuel Hunter, being of opinion that no possible benefit can arise from still further protracting such fruitless investigation." The subject of the gas frauds had been already, he said, exhaustively gone into by Committees composed of some of the best members of the Council; and the facts they had obtained had been presented to barristers of eminence, who had informed them that they had no evidence at all with which to go to a Law Court. Yet Mr. Mandley's resolution was practically a vote of censure on the Investigation Committee. Instead of a vote of censure, he thought they were entitled to the thanks of the ratepayers for what they had done.

Alderman ROBINSON seconded the amendment.

On a division the amendment was carried by 32 votes to 4; and on being put as a substantive resolution, it was agreed to.

Mr. CORBETT next proposed—"That as the Consultative Committee finds it impracticable to thoroughly investigate the cases of bribery and fraud in connection with the Salford Gas-Works contracts, and as cases of bribery and fraud are known to have existed in connection with the said contracts and to be common in many places, this Council desires that a Royal Commission may be appointed, with powers to investigate the said cases, and also the practice of bribery and fraud in connection with municipal and other contracts, with a view to remedial legislation; and that the necessary steps for applying for and obtaining a Royal Commission be taken forthwith. He said that he completely accepted the work of the Consultative Committee as being sound and good, and as being the best result that, under the circumstances, could have been arrived at; but the Council had to remember the difficulties they had to contend with, and to remember also that Salford was now occupying a leading position in the investigation of questions of municipal bribery. They had either to shirk their responsibility and stand for the future looked upon with contempt, as having entered into a battle and not gone through with it, or to go on with it and ask for new weapons in order that the battle might never be lost again as it had been lost in the present instance.

Mr. HARDMAN seconded the proposition.

Mr. RYCROFT moved the following amendment:—"That this Council, for some months past, having had investigations made into the bribery and fraud practised in connection with the late gas management, and having authorized the Consultative Committee, by the resolution of the 6th of March last, to settle all actions instituted for the recovery of moneys fraudulently obtained, and the Committee having acted upon such resolution, declines to stultify itself or to undertake the responsibility of applying for a Royal Commission, not only to re-open the same, but to investigate 'the practice of bribery and fraud in connection with municipal or other contracts' said to be 'common in many places,' with a view to remedial legislation, but authorizes the preparation of a memorial praying Her Majesty's Government to take such steps as may be necessary for the passing of an Act of Parliament making it a criminal offence for any person to give or accept, or to be a party or privy to the giving or accepting of any commission, bribe, or other valuable consideration or advantage in connection with any contract, dealing, or transaction with any municipal corporation or other public body, and that such memorial be forwarded to the Chief Secretary of the Local Government Board, and that the members of Parliament for the borough be respectfully requested to further the object of such memorial." He thought the time for asking for a Royal Commission was past when the Consultative Committee was appointed; and he did not think it was likely, after the Commission which had been appointed in the case of the Metropolitan Board of Works, the Government would appoint another Commission to inquire into the same subject. The matter was now ripe for legislation.

Mr. GADD seconded the amendment, and it was adopted.

This concluded the business before the members.

AN INDIGNATION MEETING.

An open air meeting of working men was held at Salford last Tuesday, to protest against the settlement of the claims instituted by the Corporation against Hunter and others, and against the presentation of a petition to the Home Secretary for Hunter's release. A Mr. Evans presided over a large gathering. In opening the proceedings, he said the subject they were met to discuss resolved itself into the simple proposition, Should the honour of the borough of Salford become a mere commercial commodity to be bought and sold for so much money? He thought that perhaps the Mayor of Salford, and those who backed him up, would tell them that was a subject with which an assembly of working men had nothing to do. A few days since a resolution of which notice had been given by Mr. Mandley, was ruled out of order, because the Mayor said the Committee who had the subject in hand had full power to settle it as they deemed best. It was all very well for the Mayor and his supporters to rule the roost; but he (Mr. Evans) contended that the public were the final court of appeal, and to them should be submitted subjects of momentous importance. He maintained that, by the present action of the Committee on the Hunter question, the members of it were becoming the aiders and abettors of crime of the very worst description; and they were basely taking advantage of the position in which they had been placed to make the ratepayers also aiders and abettors of the crime they were trying so nicely to hush up. He had, however, more faith in the people of Salford than to believe that they would ever consent to allow the honour of Salford to be bartered for £10,000 or even £100,000. If they did not succeed in getting a halfpenny of the money that had been stolen from them, they would be amply repaid if they unearthed those who had assisted Hunter in robbing and plundering the borough. Had it not been for the apathetic and careless attitude of their representatives during the time the robberies were going on, it would have been utterly impossible for Hunter or Graves or anyone else to have filched the money of the ratepayers as they had done. It was natural for the people to suppose—seeing the anxiety there was to hush up the Hunter business—that many of the men at the Town Hall were not so anxious for the honour of the borough as they were for the safety of some of their friends who were mixed up in the affair. Mr. Horrocks moved a resolution of indignation at the recent conduct of the Mayor, aldermen, and councillors, who had petitioned the Home Secretary on behalf of Hunter, and expressing the belief of the meeting that the acceptance of the £10,000 was dishonest and damaging to the commercial morality of the borough. In a long speech, the mover of the resolution condemned the action of the Consultative Committee, and the adoption of a petition for Hunter's release. He contended that Hunter would not pay a single penny of the £10,000, but that it would be found by others. Mr. Thompson seconded the motion, which, on being put to the meeting, was approved unanimously. Mr. J. Nield afterwards moved a resolution calling upon the representatives of the ratepayers in the Council to support Mr. Mandley's resolution demanding the appointment of a Royal Commission. The resolution was seconded and carried without a dissentient.

The ordinary monthly meeting of the Salford Town Council will be held to-morrow, when a resolution of the General Gas Committee will be considered accepting various tenders for the supply of coal and cannel required at the several gas-works. The report of the Consultative

Committee, with reference to the legal proceedings pending against Samuel Hunter and other persons, for the recovery of commissions paid on contracts relating to the Gas Department, will also be presented. The Council will order the common seal to be affixed to a memorial to Her Majesty's Government, praying for the introduction of a Bill in the ensuing session of Parliament to render the giving or receiving of bribes, commissions, or other secret benefit or reward, to public servants, in connection with contracts or other transactions, a criminal offence.

According to a Salford newspaper which was formerly very strong in its denunciation of the late Manager of the gas-works, "the Hunter agitation is to all intents and purposes at an end. Its advocates, by their false statements and indiscretions, have killed it. The thinking and sensible portion of the community of Salford were not to be hoodwinked by an enterprising journal and a few men whose lead it would be unsafe, speaking from experience, to follow on the gas question. There was never any real substantial grounds for the agitation, apart from the personal interests of those who have been engaged in it. On Wednesday the Council was true to itself as well as the ratepayers. The decisions which the members came to, show their critics and traducers that they have lost none of their self-respect or honour, and that they are not so foolish as to censure themselves for making a good bargain, or signing a petition to the Home Secretary praying him to extend the clemency of the Crown to the degraded and unhappy man in Strangeways Gaol. The Mayor's statement is a plain, truthful, unadorned defence of the action of the Consultative Committee." Proceeding to discuss the statements of some of the Manchester newspapers, the same print asserts that "there is not a shadow of reason for the assumption that the ratepayers of Salford and the Town Council disagree in the decision come to on the Hunter question as a whole." It denies that there is any real demand outside or inside the Council for a Royal Commission, and bluntly tells the Manchester critics of Salford methods that if there is to be any such inquiry it should be directed into the abuses exposed by the Elective Auditors of the city, and into such scandals as the expenditure of £100,000 on the Victoria Hotel. In one part of its issue the same paper says: "So far as our advice can have any influence, we say help the man out of prison, and then let the subject be for ever forgotten and buried, except so far as the knowledge obtained can be utilized to the advantage and good of the ratepayers."

MACCLESFIELD CORPORATION GAS SUPPLY.

The Application of the Profits.

At the last Meeting of the Macclesfield Town Council, an interesting discussion on the relation of the gas consumers to the ratepayers took place. The minutes of the Gas Committee contained an announcement of a notice by Mr. Hammond to propose at the next meeting of the Committee a reduction in the price of gas from 3s. to 2s. 10d. per 1000 cubic feet. After the minutes had been passed,

Mr. E. Crew proposed the following resolution, which stood in his name on the *agenda*:—"That this Council concurs in the desirability of any profits made by the Gas Committee being applied to the reduction of the price of gas." The position he took up was that the gas-works belonged to the town, and that the town therefore had a right to expect a reasonable profit from them; but he maintained that the town was not entitled to more than that. What were the facts? The Corporation purchased the gas-works from the old Gas Company, in 1862, for £49,000. Whether that was a proper sum to have paid for them, he did not profess to say. His opinion was that £25,000 would have been quite enough. Since advancing this £49,000, they had spent at various times in the improvement and extension of the works some £23,000; making a total outlay of £72,000. By the Act of Parliament this principal, as well as the interest on it, had to be repaid within a certain number of years—he believed the period was 30 years from now—so that in course of time the works would belong absolutely to the ratepayers, in addition to their being paid all these years' interest on their capital. Surely that was as much as the town could expect; and if that was not a very good investment, he could not imagine what was. But so high a price had they charged for gas, that the total profit they had made on this amount of capital was £134,000. That sum had been disbursed in the following manner:—£58,000 as interest; £10,000 toward sinking fund for the reduction of the principal; and (this was very important) £41,000 had gone towards enlarging the works—all out of gas profits; £12,313 had been spent in concessions in public lighting; £6699 had gone in aid of the rates; £3000 in maintenance of works; and £3000 in creating stock which they now held. So that during the whole of these years, in addition to the principal being guaranteed, and £10,000 of it being repaid, they had appropriated out of gas profits no less a sum than £66,000, or at the rate of £2400 a year, which he contended they had no right to take from the gas consumers. If they continued the present plan, and did not adopt his proposal, the people who would continue to benefit were those who paid the district rate—the owners of property; many of them not resident in the town. They were practically charging a high price for gas from those who lived in and supported the town, and giving the benefit to those who did not live in it, but who merely owned property there. They would see from the last report of the Elective Auditors that there were some 6000 householders in the borough who were not consumers of gas. If they would only reduce the price—as he contended they ought to do—the number of consumers would be greatly augmented; and the works would benefit in a corresponding degree. Experience led him irresistibly to the conclusion that had the works remained in the possession of private owners, the gas consumers would have fared much better than they had done at the hands of the Corporation, and trade would have been fostered to a much greater degree than it had been, for there could be no doubt that high-priced gas kept new industries away from a town. It might, and no doubt would be said, that the Act of 1882 specified so and so. Well, that was an Act of their own making; and if they were agreeable to the principle contained in his resolution, the Act need not stand in the way, because they could so reduce the price of gas to consumers as to leave nothing for appropriation to purposes which, he contended, ought not to receive benefit from gas profits.

Mr. Savage, while seconding the proposal, in order that it might be discussed, took exception to some of Mr. Crew's arguments. If Mr. Crew's proposal that "any profits" meant "all profits" going to the consumer, he parted company with him at once, because he held the opinion that, unless a certain sum was handed over yearly from the gas profits towards the rates, there would have to be an increase of rates. He was strongly in favour of a compromise in this matter, and would support Mr. Hammond's proposition when it came on of a further reduction of 2d. in the price of gas; the remainder of the profits to be handed over towards the rates.

Alderman Rowbotham said the Act of Parliament was so plain on this matter that he was surprised there should be any discussion at all. Section 17 of the Act was as follows:—"The Corporation shall keep the accounts of their capital and revenue in respect of their gas-works undertaking separate from all their other accounts, and shall apply all money from time to time received by them in respect of their gas undertaking, except borrowed money and other money received on capital account, as follows (that is to say): In payment of the expenses properly chargeable to revenue of conducting, managing, and maintaining the gas-works and otherwise carrying on the gas undertaking of the Corporation; in payment of the interest upon money borrowed under the Act of 1860; in payment of the interest on money borrowed under this Act for gas purposes; in providing the requisite appropriations or annual repayments on sinking fund under this Act in relation to money borrowed for gas-works purposes; and shall carry to the district fund any balance remaining in any year." Then Section 18 provided that any deficiency in the amount standing to the credit of the gas account to meet the charges thereon should be provided out of the general district rate. He argued that if the ratepayers were liable to make up any deficiency that might occur in the working of the gas-works in any year, they were entitled to share in the profits. There were many eventualities which might necessitate an application by the Gas Committee for assistance from the rates. He did not object to a reduction in the price of gas; but all the profits should not go in that way. If the Committee could see their way to lower the price of gas, and still have a surplus to go toward the rates, that would be perfectly satisfactory. There were 2694 consumers of gas, of whom 1200 were not direct ratepayers; so that to give all the profits to the consumers would be giving all the benefits to a certain number of people who had no responsibility for the maintenance of the works.

The Ex-Mayor remarked that it was true they had an Act of Parliament—whether it was a just one was quite another thing. He contended that, according to its provisions, the gas consumers were not fairly treated, and that there should be an alteration in the appropriation of the profits from the gas-works. To spend the profits of the gas-works in making new streets and repairing old ones was grossly unfair to the gas consumers—the system was rotten at the core.

After some further speeches, Mr. Crew briefly replied on the discussion; expressing his regret that it had not taken a practical turn. He contended that the Corporation had no more right to be traders in gas than they had to start a silk-mill for the benefit of the rates. Figures could be twisted, as they all knew, in different forms, but none of his arguments had been answered. As to the Act of Parliament, to his mind it was an Act passed to rob the gas consumers of what was justly their own. This did not affect his motion; and, if the principle could not be carried out in any other way, he hoped they would see to it that a sufficiently large reduction in the price of gas would be made as to do justice to the consumers. They could well afford to reduce the price of gas to 2s. 6d., and still have a good surplus. As the Chairman of the Gas Committee was absent, he consented to withdraw the motion, though he held that the matter was one for the Council, not the Gas Committee, to determine.

LEICESTER TOWN COUNCIL AND ELECTRIC LIGHTING.

At the Meeting of the Leicester Town Council last Tuesday, the members had a long discussion on a recommendation of the Gas Committee that the Council should apply to the Board of Trade for a Provisional Order to authorize the supply of electricity by the Corporation for public and private purposes in the borough. Mr. Lennard, in moving the adoption of the recommendation, said that four companies had given notice of their intention to apply to the Board of Trade for an Order to supply electric lighting in the town. The attention of the Gas Committee had been directed to the question before these notices came; and it was obvious that they were bound to face it, and carefully consider it, when legal notice of the intended companies was given them. They had to consider what was their duty towards the question, and what was the best thing to do for the town. In one sense, they would have been glad to have had no opponents of their present system of lighting; but, on the other hand, it would not be right, nor to the interest of the town, that they as a lighting authority, should put themselves in the path of progress, and say that whatever strides were made with electric lighting they would stand in its way because they had immense capital invested in gas-works. There was undoubtedly a large future for the electric light; but it would never supersede gas, as it could not compete with it in price. Mr. Ashley seconded the motion. The Mayor (Alderman E. Wood) said they had a large undertaking in their hands for lighting the town; and although they knew electricity could not be manufactured and supplied at the same price as gas—in fact it would cost two or three times as much—yet they must remember that it was one of the most beautiful lights discovered; and it would be adopted where the question of price did not come into consideration. It had several advantages; and as this was an age of luxury, they might depend there were men in Leicester who would require from someone the electric light. Seeing that they had so much money invested in their undertaking, it appeared to be only right that they should maintain it; and he looked upon the action of the Gas Committee as a very wise one. He hoped when they had the Order, they would not wait long before they introduced the electric light in Leicester. It would assist gas very materially. In public buildings it would be a great advantage, because there were no gases thrown off, and less heat was emitted from it. He was sure the Gas Committee was entering upon the enterprise with a determination to give the electric light a fair chance in Leicester. Alderman Barfoot remarked that he was glad to hear the Committee intended to go on with the project, because there was no doubt some of the companies would force the hand of the Corporation; and there was a real want for the light. He was not so certain that the expense was so much greater than gas, if it was properly carried out. He had used the electric light himself for the past six or seven years for his own works; and he had not found the expense anything like what had been shadowed forth by some who were anxious to keep the gas undertaking going. The recommendation was, after some further discussion, approved.

The Electric Light at Reading.—A local contemporary informs its readers that the electric light station in Reading is now supplying more lamps than the plant was originally intended to serve; and owing to the increased demand for the light by business firms, the contractors (Messrs. Laing, Wharton, and Down) have arranged for a considerable addition to their machinery. This is entirely independent of the street lighting, about which the Town Council have not taken any steps to carry out the resolution passed at their meeting in June last.

The Halifax Town Council and Alderman Riley.—At a meeting of the Halifax Town Council to be held to-morrow, Alderman D. Smith is to propose that two resolutions relating to Alderman Riley and the recent gas scandal shall be rescinded. They were both adopted on the 3rd of October, 1888. The first directed that any member of the Corporation named in the charges then about to be made, should be removed from the Corporation Committees until the charge had been investigated; the second called upon Alderman Riley to commence a civil action against Mr. T. K. Fox. If these resolutions are rescinded, Alderman Smith will propose the election of Alderman Riley as a member of the Water-Works and Baths and the Watch and Bonding Warehouse Committees.

NOTTINGHAM CORPORATION GAS SUPPLY.

The Annual Reports.

The annual report of the Gas Committee of the Nottingham Corporation for the year ending March 25 last, was presented at yesterday's meeting of the Town Council.

In their statement, the Committee say that this is the first year they have to report a decrease in the consumption of gas; the figures being 1,287,771,500 cubic feet, against 1,313,165,800 cubic feet last year—a decrease of 25,394,300 feet, or 1·93 per cent. It is, however, very satisfactory to find that the net profit of the year exceeds the previous year by £387; the amount for this year being £24,046, as compared with £23,658 in the previous year. The Committee point to the large advance in the price of coal, and say they consider, under the circumstances, they have been able to make favourable contracts; the average advance upon the contracts for the year being 1s. 5d. per ton. This additional cost would mean a decrease of profit of £9200 had not the Committee fortunately held a large stock bought on very favourable terms. They will not need to purchase their usual quantity by from 30,000 to 40,000 tons. The Council have directed that £20,000 of the profit of the year, and also £3600 interest on the reserve fund, be paid over to the Finance Committee. This will leave a balance of profit of £4046, which the Committee propose to place to working capital.

Subjoined to the report is a comparative statement of the gas and meter rental for the last two years—

Year to March 25.	Due June 25.	Due Sept. 25.	Due Dec. 25.	Due March 25.	Total.
1888 ..	£26,550 ..	£23,070 ..	£52,644 ..	£53,572 ..	£155,837
1889 ..	26,403 ..	23,629 ..	50,676 ..	52,043 ..	152,752

The annual report of Mr. W. R. Chester, the Engineer and General Manager, which is appended, states: "I have to report that the general efficiency of the manufacturing plant at your various works has been fully maintained. A section of the carbonizing plant in one retort-house at the Eastcroft works is being remodelled, and retorts are being set on modern regenerator principles, which are expected to effect considerable economy in working. During the year extensions of mains have taken place, and new station governors have been fixed at Eastcroft and Basford works, for the purpose of improving the supply of gas to Old Basford, Hucknall, and Colwick. These districts are now supplied by independent mains direct from the works, which enable them to obtain a steady and satisfactory supply of gas with a much lower initial pressure than was hitherto possible. Sandiacre, which formerly took gas from the Committee in bulk, has ceased to do so since Christmas last; a local gas-works recently erected having now taken up the supply. This will affect the annual consumption to the extent of about 1,500,000 cubic feet. The illuminating power of the gas has been maintained, and averaged 18·60 candles; while the sulphur compounds have been kept down to an average of 15·26 grains of sulphur per 100 cubic feet of gas. The unaccounted-for gas (loss by leakage and condensation) shows a slight improvement over last year; being 6·06 per cent., against 6·55 per cent. last year. This is a very satisfactory figure considering the extent and character of the district, and proves that the mains and services are in a highly efficient condition. During the year there has been a gradual improvement in the market values for tar and products; while sulphate of ammonia has remained almost stationary. The rise in the price of coal has also improved the value of coke; and there is now a better demand for this product than has been experienced for many years." Speaking of the distribution department, he says the total mileage of mains is 262·90; there having been 3·626 miles added to the canalization during the year. The number of meters fixed to March 25 last, including 263 lamp meters, was 38,474; being a decrease of 1123 meters on the previous year. Of these 36,736 belonged to the Gas Department, and 1738 to consumers. The orders and calls for attention of various kinds from consumers was 39,945, against 41,317 for the previous year. The number of new gas-services laid has been 1300, against 1546 in the previous year. A census of the appliances used for cooking, heating, and trade purposes other than for lighting has been taken, the details of which are shown in the following table:—

Trade appliances, viz.:—For gasing cotton, lace dressing, baking, boiling, coffee roasting, brazing, ironing, japanning, drying, &c.	732
Gas-engines	102
Domestic appliances, washers, boilers, coppers	233
Ovens, for baking only	277
Cookers complete	1056
Fires and heating-stoves	2235
Small stoves for frying and boiling	4814
Total	9448

Of the 1056 cookers in use, 790 are rented from the department. Referring to the chemical works, he observes that a new siding has been laid down during the year, enabling the traffic to pass direct on to the Midland system *viâ* Bennerley Junction. This has proved of great advantage and economy to the Committee, the full effects of which have scarcely yet been felt. Considerable renewals, all of which have been provided out of revenue, have been made to the manufacturing plant during the summer. No. 1 acid chamber has been partially renewed, and two tar-stills which were badly worn have been replaced with new ones. Additions have been made in the shape of new purifiers to the sulphate plant, and a new absorbing tower to the acid plant. The erection of a pitch-house, in connection with the tar-stills, is also in contemplation. All the apparatus has been carefully overhauled, repaired, and made ready for the ensuing winter's work.

In the course of the report of the Borough Auditor (Mr. S. P. Derbyshire) on the accounts of the department, he says: "Notwithstanding a smaller consumption of gas than last year, the year's profit, after payment of interest, &c., would appear to be £24,046 12s. 7d., as against £23,658 14s. 6d. in the previous year; but on a more careful perusal of the figures, I find that the increased profit is more than accounted for in one item—viz., repairing, renewing, and refixing meters. Under this head in 1887-8 the Committee spent £4413 1s. 3d., while in 1888-9 the sum expended was only £1748 6s. 4d. The difference is so large as to be worthy of note. The banking account bears evidence of the readiness with which the Gas Committee have handed over to the Borough Treasurer sums of money from time to time in aid of the general expenses of the borough, even though the account has had to be largely overdrawn for that purpose. On March 11, 1889, after paying the Borough Treasurer £11,000, the banking account was overdrawn to the extent of £12,907 14s. 5d.; and fourteen days later, after paying the Borough Treasurer £5000, the debit balance was £16,874 15s. 6d. To relieve the account to some extent, the Corporation advanced to the Gas Committee on its capital account the sum of £5000. On March 25, 1889, although there was a balance of £24,046 12s. 7d. standing to the credit of the profit and loss account, and £3322 16s. 11d. balance to the credit of capital account raised, but not then expended, the Committee had not a penny in hand; but on the contrary the banking account was overdrawn to the extent of £7455. The interest earned by the reserve fund investments for the year (including a balance of £4 15s. brought forward) amounts to £3899. According to a resolution of the Council, this interest was ordered to be applied to the repurchase and extinction of annuities and loans, so as to gradually relieve the capital account. During the year only £1122 10s., has been applied to this purpose—£2500 of this amount having been paid to the Borough Treasurer in relief of the rates; and the balance of £276 10s. carried forward to the next year. The before-mentioned investment of £1122 10s. reduced the capital liabilities only £907 10s., as the annuities have to be repurchased at market value. On the other hand, the capital expenditure during the year is £4879. I feel it the more important to bring these figures before you inasmuch as a desire has been shown by a section of the Council to disturb the reserve fund. I would respectfully submit that, taking into consideration the large amount of capital represented in the gas undertaking, the former resolution of the Council applying the interest on the reserve fund investments to the repurchase and extinction of annuities should be adhered to."

CRYSTAL PALACE DISTRICT GAS COMPANY.

The Half-Yearly Report and Accounts.

The Directors of this Company will, as usual, have a very satisfactory report to lay before the shareholders at their meeting on the 13th inst. There has been an increase in the quantity of gas sold, over the corresponding half-year of 1888, of 1·62 per cent. The reductions made in the price of gas from Michaelmas, 1888, and from Lady-day, 1889, have resulted in a benefit to the consumers, during the six months, of more than £2000. Tar having improved in value, the Directors state that they have discontinued the use of it for fuel. It has been decided to reduce the price of gas to 2s. 6d. per 1000 cubic feet from and after the date of the present Michaelmas quarter's accounts. The Directors recommend that an addition be made to the Secretary's (Mr. Magnus Ohren's) salary of £50 per annum. The Directors also propose the declaration of a dividend for the half year ending June 30 last at the following rates per annum—viz., 6 per cent. on the preference stock; 7 per cent. on the ordinary 7 per cent. stock; 10 per cent. on the ordinary 10 per cent. stock; and 7 per cent. on the new ordinary 7 per cent. shares—amounting to £13,625 17s. (less income-tax of £340 13s.). In the accounts accompanying the report, we find that the private gas rental for the half year amounted to £44,350, and the public rental to £3942—making together £48,292. A sum of £1007 was received as rental from gas meters and stoves; and £14,895 was the amount yielded by residual products, of which the largest item was coke, £10,874. A small sum of £53 is entered as "rents;" and this makes the total receipts on revenue account £64,247. The expenditure for the six months was £48,156, of which manufacture of gas figures at £38,839; distribution of gas, £3163; lighting and repairing public lamps, £876; rent, rates, and taxes, £2029; and management, £2972. The balance is made up of sundry items, of which bad debts is the largest (£199). The sum carried to profit and loss account is £16,091; and the net profit available for division is £27,058. The contingent fund stands at £11,477; the reserve fund at £40,000; and the insurance fund at £5000. As to capital account, the total receipts amount to £364,310; and the expenditure to £338,213, of which £2252 has been expended in the half year on buildings, manufacturing plant, pipes, meters, and gas-stoves. The balance to the credit of this account is £26,097. Turning to the coal statement, we find that 38,080 tons of coal were carbonized in the past six months, of which only 182 tons were cannel. From this quantity of coal 380,078,000 cubic feet of gas were produced.

BARNET DISTRICT GAS AND WATER COMPANY.

The Half-Yearly Meeting of this Company was held at the Guildhall Tavern, Gresham Street, E.C., last Friday—Mr. James Glaisher, F.R.S., in the chair.

The Secretary (Mr. Alfred Lass, F.C.A.) read the advertisement calling the meeting; and the report and accounts, which were noticed in our issue for the 13th ult. (p. 318), were taken as read.

The Chairman said he believed that in looking over the accounts for the half year, it must have given satisfaction to the proprietors; for comparing them with the corresponding period of the preceding year, he thought progress was marked in both branches of the business. Referring first to the gas department, he said it would be seen that the capital had only increased by £395. They had made 142,000 cubic feet less gas during the past half year than in the corresponding period of 1888. They had sold 26,109,000 cubic feet in the six months, compared with 25,385,000 feet; being 711,000 feet more, though they manufactured a smaller quantity of gas. The gas produced per ton of coal carbonized had been at the rate of 10,500 cubic feet; and they had received payment for 9927 feet—indicating that the leakage had been only about 5½ per cent. The whole of their 40 miles of mains had been for some little time, and now were, under examination. This was an important thing; and he believed it would result in advantage to the Company. Residents in Barnet had asked him why they could not sell gas at 2s. 6d. per 1000 feet as was done in London. In the first place, their coal was all carried by land; they had not the benefit of water carriage. Coal this year could be put free on board at 7s. per ton, with a freight some few pence above 3s. They could do nothing of the kind in their case; but had to pay the full carriage by land. "Field's Analysis" for last year showed that coal cost the South Metropolitan Gas Company 10s. per ton; the Commercial, 11s. 11d.; The Gaslight and Coke, 12s. 1d.; while they paid at Barnet a little short of 15s., which meant that the London Companies obtained coal 36 per cent. cheaper. Then as to residuals, they had to incur expenses to convey them to London; and so the Metropolitan Companies could obtain more for their bye-products. Therefore, he regarded 4s. per 1000 cubic feet for gas at Barnet as being nearly as cheap as gas at a good deal under 3s. would be in London. He thought it would be some time before they could reduce the price below 4s. He did not at all believe in finality; and when circumstances were more favourable, they might lower the price. The last reduction they made represented a rental of £511, but the loss was only £238; so that the increase in the consumption of gas represented a money value of £272. This held out a hope that the revenue in the current half year would be the same as heretofore. He did not wish to refer to the electric lighting in the Company's district; but he might mention that they now had 100 less public lamps to supply than formerly. With regard to the water business, the capital had augmented by £2376. The rental was constantly on the increase. It was not a very rapid advance; it was slow and continuous. He believed the supply to the district had been most satisfactory. In the hottest part of the year the consumption was close upon a million gallons; but even then they did not approach anything like the top of the adits. They had another million gallons in store; so that some years must elapse before the neighbourhood would grow and the demands of the inhabitants exhaust the supply. The whole of the machinery was in capital working order; and they had duplicate plant in case of a breakdown. Reverting to the gas supply, he said that the average illuminating power during the six months had been 15½ candles

The gas was pure, and he believed it gave satisfaction. He concluded by moving the adoption of the report and accounts.

Mr. C. Horsley seconded the motion.

Mr. Wakefield referred to the appointment of Mr. J. W. L. Glaisher to the vacancy in the directorate caused by the retirement of Mr. H. T. Balfour; and, while he did not wish to be uncomplimentary, he did not think it advisable that a father and son should be on the same Board.

The Chairman said that he had nothing to do with the nomination of his son. He did not vote upon the matter; and, in fact, he did not at the time know anything about it.

Mr. Wakefield then made a long speech on the position of affairs; pointing out that the Company did not appear to make much progress, and that the dividend remained at 7 per cent. He was told the Company ought to have a reserve fund; and he considered it was very essential.

The Chairman, in reply, expressed the opinion that it only required time to make the Company rival the Crystal Palace Gas Company. He should never sanction the payment of a dividend that had not been earned. The profit on the half year was £6548, out of which they required £1028 for interest on debentures, &c. This left them £5520. The dividend they were about to declare would need £5400; and Mr. Wakefield knew not the pleasure it gave him (the Chairman) to be able to find that they were £100 on the right side. As to the reserve, they were bound to pay the statutory dividend before they could start such a fund. In regard to the election of his son to the Board, it was no doubt thought by his colleagues that he would be of value to them in the future; and they elected him with the best intentions. He had £4000 in the concern; and he (the Chairman) had £6000.

Mr. George Anderson said that he entirely sympathized with the Board, because they had had an uphill game to play for a number of years. They had a new district, which had to be supplied with both gas and water; and, as the Chairman had said, it required time to develop the district. He (Mr. Anderson) had no doubt that when it was developed, the Company would be a much better looking one than it had ever been. They must progress with the times; and he thought that in some respects they were doing so. This time last year they had 2,376,000 cubic feet of gas unaccounted for; this year there was only a loss of 1,500,000 feet. This was a great improvement, which he congratulated the Board upon, and hoped would continue, because gas lost was not good for anybody. In looking through the accounts, he found that the balance of profit was less now than at this time last year. He saw that £128 more had been expended than during the corresponding half of 1888; and he supposed this was expended on the mains. He congratulated the Board upon the success which had attended their efforts; for if they brought more gas into charge that was an advantage. He considered that 40 miles of pipes was a very large quantity for the small consumption of gas. As he had said, the district was undeveloped; and if these pipes had been delivering gas at the rate the pipes in London were supplying it, they would have had three times more rental, and much more profit. In a Company like theirs, where the area was only partially developed, they had a good deal of idle capital. When the district became more thickly populated, more gas would be required; and they would be able to supply it with the present mains, or with very little addition to them. He did not look unhopefully, although, with Mr. Wakefield, he thought their progress was very slow. On turning back, he found the consumption now for private lighting was the same as two years ago. They could not, however, blame the Directors for that. Speaking of the competitors of gas, he said that oil, like electricity, would have its day; and after people had had some experience of it, they would return to gas. As to electricity, it was like the measles. When once one got the measles, he must go through with them. There were a number of people who had caught the measles for electricity; and they would go through with them, and after a time return to gas.

The Chairman (interrupting) said they had only on the average 34 consumers per mile of main.

Mr. Anderson said that in London they had from 3000 to 5000 consumers per mile. Two years ago, he continued, he complained about the yield of ammonia from the coal; but he found they had improved in that respect. In the half year ending December, 1887, it took 137½ tons of coal to produce a ton of sulphate; but he found it on the book 125 tons now. He did not say they were quite perfect; but they could go on and improve. He did not know whether the Chairman referred to the question of cooking by gas. A year or two ago, at one of the meetings, the matter was fully discussed; and the Directors said they would give attention to it. It was to the interest of the Company that they should supply gas for heating and cooking at a lower price than was charged for a supply for lighting purposes. The Company were now doing that. At Barnet their charge was 4s. He did not know what the gas cost to produce; but he would assume the net cost was 2s.

The Chairman: It is more than 2s. 6d.

Mr. Anderson said it was a question of degree; and all he wanted to give was the principle—that if they were to sell gas during the daytime at a mere profit of 6d. per 1000 feet, it was better than not selling it at all. He had several Companies under his control that were doing this. In some cases they sold the gas for cooking and heating at three-fourths the price that they charged for lighting. If they were to supply gas in this way, he was sure the Company would be greatly benefited.

The Chairman said the question of a lower price for cooking and heating had been well considered by the Board; and they were doing all they could in the way of introducing gas-stoves. With regard to the question of sulphate, they had one of Anderson's brush washers and a Livesey scrubber; and they were going to put in one of Cutler's condensers.

The motion was then carried.

On the proposal of the Chairman, seconded by Mr. Horsley, dividends were declared for the half year at the rate of 7 per cent. per annum on the "A" and "C" stocks; 6 per cent. on the "B" stock, and £4 18s. per cent. on the "D" capital (water), less income-tax.

The Chairman moved that the thanks of the meeting be given to the Secretary (Mr. A. Lass), the Engineer (Mr. T. H. Martin), Mr. Wright, and the Auditors (Messrs. F. Lennard and A. G. Hounsham).

Mr. Wakefield seconded the motion, which was unanimously agreed to.

The vote having been suitably acknowledged, a similar compliment was paid to the Directors, and the proceedings terminated.

Ludlow Water Supply.—An inquiry was held last Tuesday at Ludlow by Mr. S. J. Smith, C.E., respecting an application by the Corporation to the Local Government Board for permission to borrow £1500 for waterworks purposes. There was no opposition.

Sale of Shares.—At Brighouse, on Friday night last, £550 of *Newcastle Consolidated Gas Stock*, paying 9½ per cent., was sold at a premium of £82 per £100. Thirty-seven £30 shares in the *Dudley Gas Company*, paying 10 per cent., were sold at £62 10s. each; 68 shares in the *Rastrick Gas Company*, £10 paid, sold at £22 15s.; and 18 shares (£5 paid up) in the *Clayton, Allerton, and Thornton Gas Company*, paying 7½ per cent., fetched £10 10s. per share.

PROVINCIAL GAS AND WATER COMPANIES.

Below we give summaries of the particulars which had been received of the working during the periods mentioned, of the various Provincial Gas and Water Companies referred to.

To-morrow the Directors of the Sunderland Gas Company will have the pleasure of submitting to the shareholders a report on the past year's operations which will, we believe, afford general gratification. The quantity of gas manufactured during the twelve months has increased upwards of 10 per cent.; and this circumstance, combined with the favourable existing coal and other contracts, has enabled the Board almost to overtake the loss caused by the reduction in price announced at the last annual meeting. As anticipated by the Directors, the demand for gas for power purposes has been greatly stimulated by the reduction to 1s. 6d. per 1000 cubic feet net to all consumers of 500,000 cubic feet and upwards per quarter. For the purpose of still further developing the consumption of gas, especially during the day-time, arrangements have been made whereby gas cooking-stoves can be hired or purchased from the Company on reasonable terms. In consideration of the usefulness of the Sunderland Infirmary, and also of the fact that the workmen of the Company have often participated in its advantages, the Directors have pleasure in suggesting (subject to the consent of the shareholders) that the sum of 100 guineas be voted towards the completion of the Hartley wing of that Institution, and a proposal to that effect will be laid before the shareholders at their meeting to-morrow. An interim dividend was paid in March last; and the Directors now recommend the declaration of a like payment of 5 per cent. on the original stock, and of 4½ per cent. on the "additional" capital stock of the Company. The accounts show that the balance from last year, after paying the dividend, was £10,861; and adding to this £46,925 received for gas and meter rentals, £12,961 for residuals, and £394 for sundries, makes a total of £71,143. The expenditure amounted to £45,452; so that a balance remained of £25,691.

The total receipts of the Wolverhampton Gas Company for the past half year came to £27,962; and the expenditure to £20,869—leaving a net amount of profit of £7092, which, added to the balance from the last account, amounted to £8415. From this the Directors, in their report, recommended the payment of a 5 per cent. dividend upon the consolidated stock, and 3 per cent. upon the preference shares, less income-tax. These dividends will absorb £6271; leaving a balance of £2143. From the balance, £600 will be transferred to the reserve fund, and the remainder carried forward to the next account. The reduction in the price of gas announced in the last report, came into operation at the commencement of the year; and the Directors anticipate that it will lead to an increased consumption, as on previous occasions. In addressing the shareholders, at their ordinary meeting held last Tuesday, the Chairman (Mr. J. Underhill) congratulated them upon the fact that in spite of a reduction in the charge for gas, which had been in operation during the whole of the half year, of 2d. per 1000 cubic feet, the profits were sufficient to pay the usual dividends, and to carry forward a balance. The dividends, however, would now and for the future be paid less income-tax, as there was a doubt as to whether it should be paid in any other form. The dividends had not only been earned, but there was a balance remaining above £2000; and of this sum it was proposed to place £600 to the credit of the reserve fund—making it £4928—and carry forward £1471. This was a larger balance than was usually carried forward; but it was deemed advisable to adopt this course in view of the extra cost that would be entailed through the advance in the price of coal. Against the higher value of coal they would have to struggle; but on the other hand it was hoped that they would receive a deal more for coke and residuals, and he did not think there was any likelihood, whatever price might have to be paid for coal, of the price of gas being advanced for twelve months. Mr. W. H. Owen seconded the motion, which was adopted. The dividends as recommended were declared, and votes of thanks were accorded to the Directors, and to the Manager (Mr. J. Annan) and officials.

The affairs of the Eastbourne Gas Company appear to be in a very healthy condition, notwithstanding the exertions of the Electric Light Company to increase the number of their *clientèle*. At the meeting of the Gas Company yesterday week, Dr. G. A. Jeffery, the Chairman, had the pleasure of reporting, on behalf of the Directors, that there was a net profit on the past half-year's working of £4907. Deducting therefrom the sum of £21 paid for interest, there remained £4886, which, added to £2931 (the balance brought forward after payment of the dividend in March last), gave a total sum of £7817 16s. 5d. available for division. The Directors recommended that a dividend be declared at the rate of 12½ per cent. per annum, upon the £20,000 original capital of the Company, and also upon the £12,490 (the amount raised on "C" shares), and at the rate of 9½ per cent. upon the £55,000 paid up capital raised on "B" shares, which would absorb the sum of £4633, and leave a balance of £3184 to be carried forward. The report was adopted.

Addressing the shareholders at the half-yearly meeting of the Sutton Gas Company yesterday week, Mr. C. R. Mead, the Chairman, made special reference to the success of the exhibition of gas apparatus for cooking, &c., held during the winter, and spoke of the suitability of gas for such purposes, and the probable increase of the consumption in consequence. The report, he said, stated that £100 had been transferred to the reserve fund account; and the Directors recommended a dividend at the rate of 10 per cent. per annum on the original capital, and 7 per cent. on the paid-up additional capital, less income-tax. The report and the recommendation as to dividends were approved; and the usual acknowledgments of the services of the Directors and officials were made. The Secretary (Mr. Frank Mead) responded on behalf of the latter.

The shareholders of the Accrington Gas and Water Company held their half-yearly meeting yesterday week. The report stated that the capital expenditure this year had been £342 for new mains, £51 for new service-pipes, and £309 for new meters. The revenue continued to increase steadily. The receipts from gas (notwithstanding a reduction in the price charged), water, coke, tar, and ammoniacal liquor, were considerably more than those of the half year ending June 30, 1888. The balance available for dividend would enable the Directors to recommend the usual distribution of 10 per cent. per annum on the £10,500 of "A" stock, and 8 per cent. per annum on the "B" stock and called-up shares, and to carry forward the balance to the current accounts. The number of additional consumers during the half year was: Gas, 289; water, 192.

On Monday last week, the shareholders of the Canterbury Gas and Water Company held their half-yearly meeting, when Alderman Hart (who presided in the absence of the Chairman) stated that the amount of gas sold in the past six months was less than in the corresponding period of last year. It was rather an unusual thing for them to be on a retrogressive scale, but they might perhaps account for it from the fact that the days had been considerably lighter this half year. Still the decrease had been made up by the residual products, which, he was glad to say, had yielded much more than last year. They had also been able to purchase coals at a cheaper rate than many other companies. The old contract was renewed at, he believed, a lower price. During the year the price of coals had gone up very considerably, to the disadvantage of

many gas companies in the country; but they were obtaining their supply of coals at fully 2s. per ton less than other companies were now being charged. Still they must not forget that probably next year the Company might have to pay for coal at an increased rate. The report of the Directors was approved, and a dividend at the rate of 8 per cent. per annum, free of income-tax, was declared.

The annual meeting of the Salisbury Gas Company was held last Wednesday week; Mr. W. Osmond presiding. The Directors, in their report, congratulated the shareholders on the fact that the improvement in the revenue manifested last year had been maintained. The net profits for the year, after meeting all liabilities, were £2368. The following dividends for the half year ending June 30 were declared:—10 per cent. per annum on £11,000 of original shares, £8 per cent. on £6000 of new ordinary shares, 7 per cent. on £5000 of new ordinary shares, and 6 per cent. on £4000 of preference shares. The report was adopted.

According to the statement made by the Chairman of the Normanton Gas Company (Dr. Statter) at the recent meeting of the shareholders, there was a slight decrease in the amount of gas manufactured during the half year. He believed, however, they might look forward to some improvement, as he understood building operations were going on somewhat more extensively than usual. More gas would in that case be required; and if Normanton went on flourishing, they would no doubt partake in the general prosperity. The quantity of gas made in the half year was 11,275,000 cubic feet, which was 55,000 feet decrease. The leakage was 13 per cent., or ½ per cent. less than a year ago. The illuminating power had been 16·62 candles; so that the Company had given the consumers 2½ candles above the requisite figure. They were determined to give good gas if it cost them a little more. The report was adopted, and a dividend of 8 per cent. was declared, free of income-tax.

The half-yearly report of the Directors of the Milnrow Gas Company has been issued; and in it they state that the disposable balance is £661 16s., out of which they recommend a dividend of 8 per cent. per annum, free of income-tax.

The half-yearly meeting of the South Staffordshire Water Company was held last Thursday, at Birmingham, Mr. F. James, who presided, in moving the adoption of the report (*ante*, p. 319), alluded to the proposal to create and allot the balance of ordinary and debenture stock. The amount to be created was £60,750 ordinary stock, and £20,250 of debenture stock. This would bring the total amount of "A" stock to £225,000; "B" stock to £350,000; preference stock to £175,000; and the 4 per cent. debenture stock to £185,000—a grand total of £935,000. The Company's parliamentary powers enabled them to raise stock to the amount of £950,000; but the balance of £15,000 they were unable to issue, because certain property which they purchased was acquired subject to a perpetual annual rent, and that was supposed to be covered by the £15,000. The "A" stock was limited by Act of Parliament to a 10 per cent. dividend; the "B" stock to a 7 per cent. dividend; the preference stock was subject to a preferential interest of 5 per cent. over the whole, with the exception of £6250; the old Dudley preferential stock was limited to 4 per cent.; and the dividend payable on the debenture stock was 4 per cent. Notwithstanding that the "A" stock was limited to 10 per cent. dividend, and the "B" stock to a payment of 7 per cent., when they went to Parliament some time ago there was a limitation put upon the dividend of 6 per cent. on the whole until they had reduced the rates within the Dudley district equal to the other parts of South Staffordshire. The capital account showed a balance due in June last of £13,156. All the money the Directors had available for the purpose of meeting that capital expenditure was £3137—the debenture stock unissued at that date. Since June 30 this £3137 had been issued at 20 per cent. premium; and the money was paid into the bank on Aug. 1—producing something like £680 to the credit of the works account. The expenditure on capital account amounted for the half year to £9680. The number of houses laid on during the past half year was 918, as compared with 1500 in the previous half year. The total number of houses supplied was 67,680, and the gross amount of water-rate was £35,100, against £33,973 in the previous half year—a very satisfactory increase. The various expenses had been reduced in the aggregate from £14,633 to £13,264; but there had recently been a considerable advance in the price of coal. The report was adopted, and dividends at the rate of 5 per cent. on the preference stock, 4 per cent. on the Dudley stock, and 5 per cent. on the ordinary stock were declared. New ordinary stock to the amount of £60,750, and new debenture stock to the amount of £20,250, were also created.

At the half-yearly meeting of the Warrington Water-Works Company, the Directors submitted a report which stated that the revenue account showed a balance, including £1008 brought from the previous half year, of £4381. The preference charges amounted to £900; leaving a balance of £3481, out of which the Directors recommended that a dividend be paid at the rate of 6½ per cent. per annum on the ordinary share capital, carrying forward the sum of £1043 to the following half year. The reserve fund, it was stated, amounted to the sum of £3743. On the motion of the Chairman (Lord Winmarleigh), who congratulated the shareholders upon the flourishing condition of the Company and its satisfactory financial position, the report was unanimously adopted; and a dividend according to the recommendation of the Directors was declared.

The annual meeting of the East Worcestershire Water Company was held last Thursday, at Birmingham—Lord Windsor presiding. The report for the half year ended June 30 showed that 162 additional services had been laid on; making up the total to 1906. Consequent upon the resolution of the shareholders passed on May 2, the Directors had offered to the shareholders additional shares in the proportion of one for every five held; and the response had fulfilled their expectations. Shares to the number of 956 had been taken up, and of the remainder, authorized to be issued at a discount, it was not proposed to allot any more at present. The increase of capital had enabled the Directors to reduce the loan from the Bank of England by £1200; and the remaining loans would be repaid at an early date. Several extensions of mains had been made, amounting in all to 2700 yards, at a cost of £500. A further small increase had taken place in the water rentals, but not a sufficient one to cover the increase in the charges on that account. There was, however, a net profit for the half year of £262, which, added to the balance of £1170 11s. 5d. brought forward, made up a sum of £1433 4s. 6d. available for distribution. It was proposed to divide £761 8s. in the payment of a dividend on the old shares of 1½ per cent. for the twelve months ending June, and to carry forward the balance to the next account. The report was adopted.

The income for the past half year of the West Surrey Water Company, after making provision for empty houses, irrecoverable rates, &c., amounted to £2291, and the expenditure to £959. In comparison with the corresponding half year of 1888, the income exhibits an increase of £154, and the expenditure an increase of £86. For the extension of the services, 1260 yards of cast-iron pipe were laid, and 49 new supplies connected—representing a future rental of £123 per annum. In their report, the Directors state that the Company's new filter-bed has proved of great utility. The Rickmansworth and Uxbridge Valley Water Company, they also mention, introduced a Bill into Parliament, by which they sought powers to extend their district and embrace within it the parish of Shepperton, which is within the parliamentary area of the West Surrey Company. The Bill was petitioned against by the Company and others, and withdrawn by the promoters before reaching Committee. With reference to the sum of £4000 referred to in the last report, and offered by tender in March last, £2350 was applied for and allotted—leaving a balance of £1650 yet to be issued. The sum available for division amounted to £1239, which the Directors recommended should be applied as follows:—To the payment of dividends upon the preference shares, amounting to £536 10s., and of a dividend at the rate of 3½ per cent. per annum upon the ordinary shares, amounting to £544; and leaving a balance of £158. At the meeting of the shareholders last Tuesday, the report was approved, and the Directors' proposal as to dividends agreed to.

The half-yearly meeting of the South Essex Water Company was held at the Guildhall Tavern, Gresham Street, E.C., last Friday. The Chairman (Mr. W. Cracroft Fookes), in addressing the shareholders, pointed out the chief features in the report and accounts. A net profit of £2961 was made during the half year. New services to the number of 266 were added; representing an addition of £284 to the annual revenue according to the present rating. Applications amounting to £3880 stock in the proportions of 80 per cent. preference and 20 per cent. ordinary stock had been received, and allotments made. A sum of £900 had been received in respect of debenture stock; and £500 had been paid off mortgage debentures. The amount to the credit of the half-year's working was £2855; and this added to the amount brought forward, resulted in the placing of £5448 to the credit of profit and loss account. The Chairman, in conclusion, moved the adoption of the report. Mr. J. C. Amos then made a long statement on the affairs of the Company. He mentioned that the expenses had decreased; and that it had been found necessary to lay larger mains in parts of the Company's district. The report was adopted; and dividends were afterwards declared at the rate of 5 per cent. on the preference stock, and 1 per cent. on the ordinary stock.

The half-yearly meeting of the Chichester Water Company was recently held, at which a report was presented by the Directors of a very favourable character. The total profits were £929 19s., which, together with the sum of £760, the balance of profits brought forward from the previous half year, made £1690, out of which the Directors were able to declare a dividend of 7s. 11d. per share on the fully paid up shares, and 6s. 4d. per share on the partly paid-up shares (£8 paid), free of income-tax; also an interim dividend of 8s. 9d. per share on the fully paid-up shares, and 1s. per share on the partly paid-up shares, being at the rate of 8¾ per cent. per annum.

The Neath Water Company have declared a dividend for the half year at the rate of 8 per cent. per annum on the "A" shares.

The receipts of the Lewes Water Company during the year ending June 24 last amounted to £2994, and the expenses to £1053—leaving a balance of £1940. The interim dividend absorbed £815; so that £1125 remained for distribution among the proprietors. At the meeting of the Company last Wednesday, dividends were declared for the half year as follows:—5 per cent. upon the original share capital, 3¼ per cent. on the new share capital, and 2½ per cent. on the preferential shares. It was also agreed to pay to the holders of the original shares a bonus of £1 5s. per share.

The report of the Directors of the Leatherhead District Water Company for the past six months stated that the receipts had amounted to £652, and working expenses to £411—leaving a profit of £240, and making with the balance brought forward from the previous half year, a total of £334. Deducting from this sum the charges for interest on debenture stock, £36 6s., there remained £247 13s. to be distributed among the shareholders. The Directors recommended a dividend of 1½ per cent. per annum (£156) leaving a balance to be carried forward of £91. The report was adopted at the meeting of the shareholders last Wednesday, on the motion of the Chairman (Mr. H. Rokeby Price).

BRISTOL UNITED GAS COMPANY.

The Half-Yearly General Meeting of this Company was held last Tuesday—Mr. S. Jones presiding.

The Secretary (Mr. J. V. Green) read the notice calling the meeting; and it was agreed to take as read the report and accounts, some particulars of which appeared in the Journal last week.

The Chairman moved the adoption of the report and accounts. In doing so, he said he thought the shareholders would consider that they were satisfactory. After adding £5000 to the reserve fund and providing for the full statutory dividend, they were able to carry forward a balance of £5667. This being their financial position, the Directors had announced a reduction of 2d. per 1000 cubic feet in the price of gas. This would really mean a reduction of £11,000; but they would get some benefit, for the Sanitary Authority took £1200 of this reduction, so that they would obtain a difference in the rates to that extent. They had found that in some cases the capacity of the mains was insufficient, and new mains had been laid down in various parts. These mains were not finished during the past half year; and, therefore, there was only a small portion of the expense included in the accounts. These additional mains were now completed, and gave a full supply of gas; and for some time past, as far as the supply was concerned, they had had no complaints. They intended, as soon as possible, to lay a main for the supply of Knowle and Totterdown, which would also furnish a relief to Bedminster, where houses were increasing very rapidly. The new mains were nearly three miles in length. Referring to the accounts, he stated that they had expended £4013 on new buildings, plant, mains, service-pipes, &c. Of this, £1002 arose partly from their putting an upper lift to a gasholder in Avon Street, which would give an increased storeage capacity of between 400,000 and 500,000 cubic feet. This was found to be a necessary work; and it was a much less expensive way of obtaining storeage than by constructing a new gasholder and tank. A sum of £2115 had been spent for new mains and service-pipes; and there was also an item of £1037 for gas-stoves. They were supplying stoves to a rather considerable extent, rather for the sake of inducing people to use gas than for making profit on the stoves. Turning to the revenue account, they found that the coal carbonized was just about the same as for the corresponding half of last year; but from this coal they had manufactured more gas. Then the purification account showed an increase; but the wages paid for carbonizing were a trifle less, although more coal had been carbonized. The repairs and maintenance of works showed a very large adverse difference this time—viz., £12,655, against £5534. This was accounted for to a considerable extent by the fact that usual works were not done in the 1888 half; and consequently they fell upon this half year. If they went back the last three years, instead of £5534 they would find that £9000 was the average; so that the great apparent excess this half year was not an increase over the general expenditure. They had been doing more in the way of renewing the beds of retorts, and were now putting six retorts instead of five into each setting; so that they would have the power of carbonizing one-fifth more coal than under the old system. In three years the whole of the retort system would, he believed, be renewed upon

the new plan. Other works and alterations had been carried out. On the other side of the account, it would be seen that they had sold nearly £3000 worth more gas; and he thought the increase would be larger still before the shareholders met again. Since their last meeting, the Chairman proceeded, they had lost two of their oldest Directors. Mr. Colthurst wrote to him saying that he was no longer a shareholder, and therefore his seat at the Board was vacated. He had been on the Board from the time of the union of the two Companies—the old Oil Gas Company and the Coal Gas Company. They had had another loss in the retirement of Sir Joseph Weston, who had been with them more than 17 years, but who found that his business engagements rendered it imperative that he should resign. In the place of Mr. Colthurst, the Directors had elected Mr. J. W. S. Dix. In the room of Sir Joseph Weston, they had elected Mr. J. A. Jones, a gentleman well known in Bristol. He thought they would agree that the Board had been very fortunate in the selection of two such able men to assist them.

Dr. HIGHETT seconded the resolution.

Mr. GILES said the minutes of the last meeting were not properly recorded. They were inaccurate; and that would be the proper time to amend them.

The CHAIRMAN ruled Mr. Giles to be out of order.

Mr. GILES submitted, and then proceeded to remark that the Chairman had spoken of the retirement of the late Chairman.

The CHAIRMAN: I did not speak of his retirement, but that not holding any qualification he ceased to be a Director.

Mr. GILES said that, at all events, the Chairman expressed regret that they had lost the services of Mr. Colthurst, after many years. Continuing, Mr. Giles said he understood that, not officially but privately, and with the cognizance of the Board, it had been suggested to Mr. Colthurst that he should retire.

The CHAIRMAN said that was not so.

Mr. A. E. BOBBETT, speaking as one of the Provisional Committee of Shareholders, said it was distinctly stated by a Director that they had used their influence privately to induce Mr. Colthurst to retire from the chairmanship; but he did not understand that from the Board. It was announced on the morning that the Committee went down to Canons' Marsh that he had disposed of his stock in some way, and had ceased to be a proprietor, and therefore ceased to be a Director.

Mr. GILES was proceeding, when

Mr. J. HAWKESLEY rose to a point of order, and insisted that the only business before the meeting was the reception and approval of the report and accounts. He objected to charges being made against a gentleman who was not present.

After a little passage of arms between Mr. Giles and Mr. Hawkesley,

Mr. GILES said he should reserve the right of bringing forward the matter of the report of the Provisional Committee and the reply of the Board.

Mr. BRITTAN said that was for the meeting to decide.

The motion was then adopted; and a dividend at the rate of 10 per cent. per annum was declared.

The CHAIRMAN said the Directors had now to submit a resolution for advancing the salary of the Secretary from £600 to £700 per annum. Mr. Green was a very able officer; and he hoped that, as an acknowledgment of his valuable services, the shareholders would agree to the resolution he proposed, which was that the salary of the Secretary be increased from £600 to £700 per annum.

Dr. TUCKETT, in seconding the resolution, said he thought the Secretary very well deserved the advance of £100.

The resolution was carried by a large majority.

Mr. GREEN having thanked the proprietors,

Mr. GILES proceeded to challenge the conduct of the Directors in regard to the investigation which he said the Chairman of the last meeting had promised.

Mr. BRITTAN, the Company's Solicitor, at the instance of Mr. Hawkesley, read a section of the Companies' Clauses Act, which showed that Mr. Giles should have given notice of his intention. He, however, thought it best to allow Mr. Giles to proceed. Certain charges had been made; and it was better to have the matter thrashed out.

Mr. GILES resumed, and contended that the Directors had not kept faith with the Provisional Committee.

Mr. DIX denied this, and said there had been no violation on the part of the Directors of the understanding at the last meeting,

Mr. HAWKESLEY again rose to a point of order, and said Mr. Giles had abundant opportunity of inspecting the books of the Company. He was availing himself of what he called an opportunity, but which opportunity the law denied him, to make an attack upon the private character of a man who was not present and could not answer for himself. He hoped the Chairman would rule that nothing of a libellous character could be expressed in that room.

The CHAIRMAN: Our Solicitor has told you that this matter of the Special Committee cannot be brought before us without notice.

Mr. GILES: I am going to move a vote of no confidence in the Directors.

The CHAIRMAN appealed to the meeting, and asked whether they wished Mr. Giles to proceed.

Mr. MEDWAY asked the Chairman to let Mr. Giles have a hearing, or else rule him out of order.

Mr. GILES: Allow me, for the protection of the Board, to say that if you quash this matter you will certainly produce a very unfavourable impression outside.

Mr. BRITTAN: You have done your best to do that.

Mr. GILES asserted that he was quite in order. Resuming his indictment of the Directors and Secretary, he read several extracts from the correspondence between the Board and the Provisional Committee. The Directors, he said, promised a Committee of Investigation into charges he had made; but, for the sake of argument, if they did not do that, they promised something, but had absolutely performed nothing. He proceeded to refer to incidents in 1887, and his own election to the Board, when,

The CHAIRMAN said he really must rule that that was out of order. They could not go back.

Mr. GILES protested against the Chairman's ruling.

The CHAIRMAN appealed to the meeting whether he should not close the discussion.

On a show of hands,

The CHAIRMAN said it was carried, and the meeting was ended.

On the motion of Mr. ROBJENT, seconded by Dr. TUCKETT, a vote of thanks to, and confidence in, the Directors was passed.

In the course of a letter addressed to a local paper, Mr. Giles says there were two important matters which he had hoped to have mentioned at the meeting of the Company—viz., (1) If the Board had prosecuted the sliding scale last October upon terms privately recommended to them by him, the proprietors would now be in a position to divide 11 per cent. (nominal) on the basis of the reduced price of gas—viz., 2s. 2d. per 1000 cubic feet. (2) If the Board had been willing to listen to his proposed reforms, considerable advance would by now have been made towards further reduction of manufacturing expenses to the extent of more than £20,000 per annum, viz.:

Consumption of coke in carbonizing	£6,246
Carbonizing wages	11,135
Ammoniacal products (say)	2,000
Gas coal (say)	2,000
	£21,381

The letter proceeded: "The coke and carbonizing wages are not hypothetical estimates, but are exact calculations on actual data. The other items are based upon substantial information; and I believe them to be understated. Considerable economy and greater efficiency may also be effected in management charges not included in the above table. Bristol consumes 32½ per cent. of coke in carbonizing a given weight of coal; while other companies range as low as 10½ per cent. Bristol stands last but one in order of merit among 24 companies and corporations taken indiscriminately—the worst in the list being the notorious Salford Corporation Gas-Works. Bristol expends rather more than 4½d. in carbonizing wages for every 1000 cubic feet of gas produced, and is by far the worst of 18 companies and corporations indiscriminately taken. Birmingham and Bath expend rather less than 2½d. to perform the same service. A well-managed company ought not to sink below the medial line in a comparison of this kind; and the tabulated results have been arrived at by assuming as the standard the average of the first twelve and the first nine companies in the respective lists. Neither gas proprietors nor the public should be satisfied with a lower degree of excellence than this."

PARTICK, HILLHEAD, AND MARYHILL GAS COMPANY.

The Ordinary General Meeting of this Company was held in Glasgow last Friday—Mr. HENRY COWAN presiding.

The SECRETARY (Mr. J. Graham, C.A.) submitted the annual report of the Directors, a summary of which, together with an abstract of the accounts, was given in last week's JOURNAL.

The CHAIRMAN, in moving the adoption of the report (which was taken as read), said that the business of the Company still continued steadily to improve; and from the amount of new property that was being erected in the district—which would bring more fully into play the large amount of piping that had to some extent been previously unproductive—the Directors looked forward to a considerable increase in the consumption of gas during the ensuing winter. Although the price of gas had been reduced from 2s. 8d. to 2s. 6d. per 1000 cubic feet, they hoped to overcome that by the extra receipts for residuals, by more economical working, owing to several improvements made at the works, and by the favourable contracts made for coal for the coming lighting season. The new holder that had been referred to in the previous year's report had been in operation since last October and had given great satisfaction. The extension of the purifying plant had been completed, as had also the new purifier-shed. Speaking of the new retort-house, he said that it had likewise been finished, and that a new bench capable of containing 112 retorts was in course of construction, the whole of which would be ready for use in time for the winter trade. They hoped to have the addition to the coal-store completed in the course of a few days. A new station was being erected, and would be completed in time for the busy season. The railway siding which had been laid down into and through the works had been of great advantage, as it enabled the Manager to get the residual products disposed of more economically and with greater expedition. A locomotive engine had been purchased for the purpose of hauling the coal into the works and for moving the coke and other materials to and fro, as might be desired. In this way labour to a large extent had been saved. In the course of his subsequent remarks, the Chairman said that the shareholders would have observed that in one of the paragraphs of the report reference had been made to the question of electric lighting. Last year an Act of Parliament was passed for the purpose of facilitating the supplying of electric lighting, in consequence of which several notices had been given by various parties of their intention to apply to the Board of Trade for Provisional Orders. Whilst the Directors had no reason to fear any serious competition with gas, they had at present under consideration the question of applying for the necessary powers to enable the Company to secure the right, and thus to protect their position. To their Manager (Mr. L. Monk), Mr. Crawford, the collectors, and the other officials of the Company, the Directors had to express their acknowledgments. After referring to the numerous meetings which the Directors had held during the past year, the Chairman formally submitted his motion for the adoption of the report and the declaration of the dividends recommended by the Directors. The motion was duly seconded, and unanimously agreed to.

The retiring Directors (Messrs. Shaw and Mathie) were re-elected; and the Auditor (Mr. J. Wilson, C.A.) was also re-appointed.

Mr. JOHN HURLL subsequently submitted a motion to the effect that a sum of £400 be appropriated as Directors' fees, the same amount to be annually laid aside for that purpose until further resolved upon. He complimented the Directors on the highly satisfactory condition to which they had brought the affairs of the Company. Being himself a Director of other companies, he knew something of the work which had to be done; and he was quite satisfied in his own mind that Mr. Cowan and his colleagues fully deserved all that his motion proposed to give them.

Mr. J. WILSON, M.P., who also spoke very highly of the successful labours of the Directors, seconded the motion, which was carried unanimously.

The CHAIRMAN having briefly acknowledged the vote, the proceedings terminated.

ADVANCE IN THE PRICE OF GAS AT BARNSLEY.—Last Friday the Director of the Barnsley Gas Company announced their intention to increase the price of gas 4d. per 1000 cubic feet. At present the price under 100,000 cubic feet is 3s., payable quarterly. On and after Oct. 1 next, the price will be 3s. 4d., with a proportionate discount according to the quantity of gas consumed. The cause of the contemplated increase is, according to the advertisement giving notice of the change, "the recent great advance in the cost of gas coal."

THE BRADFORD ELECTRIC LIGHTING SCHEME.—The arrangements for the supply of electric light in Bradford are now practically complete; and it is stated that it would be possible to supply current immediately were it considered urgently necessary. The matter came under the consideration of the Electric Lighting and Gas Supply Committee at a meeting held last Friday, when Alderman F. Priestman presided. It was stated that the engines had been thoroughly tested, and proved to be efficient for their work, and all the apparatus, with the exception of some internal fittings at the generating-station, was in a satisfactory condition. It will be necessary, however, to engage a staff of *employés*; and, inasmuch as the demand for the new lighting medium is not likely to be very great until the evenings lengthen, and as several of the members of the Committee were absent, it was thought advisable to postpone the inauguration of the installation until about the middle of next month.

NORTH BRITISH WATER GAS SYNDICATE.

The Statutory Meeting of this Syndicate was held last Thursday, at Glasgow—Mr. J. Reid Stewart in the chair.

The Chairman, in his opening statement, said the Directors had been able to make important modifications in the contract, very favourable to the Company, in connection with the purchase of water-gas patents for Scotland. By the terms of the contract referred to in the prospectus, the price to be paid was £251,000, which was payable £200,000 in cash, £50,000 in fully paid-up ordinary shares, and £1000 in fully paid-up founders' shares. The Board, in adopting the contract, agreed that all licences should be granted direct to the Company by the British Water Gas Syndicate; and this had been carried into effect in the recent agreement. Before the allotment of the shares, one of the Directors, Mr. Donald Graham, had retired from the directorate, of which notice was affixed to each allotment letter. A number of shareholders requested their allotments should be cancelled, ostensibly in consequence of Mr. Graham retiring; and the British Water Gas Syndicate agreed to take up the shares of all those dissentients who withdrew at once. These shares being purchased at par, and with the shares applied for by the British Water Gas Syndicate, made a total of 5255 shares. As would be seen by the circular, that number had to be augmented to 10,000 shares. These 10,000, with the 10,000 as part of the purchase price—making in all 20,000 shares—were not to rank for dividend until 50 per cent. should have been paid on the remaining 40,000 shares of the Company; and in the event of liquidation of the Company before these cumulative dividends had been fully paid, the 20,000 shares were not to rank on the assets until all the holders of the remaining 40,000 shares should have received a return in full of their capital. Another very important concession had been made to them—viz., an addition to their territory, which was now to include the important counties of Northumberland, Durham, Cumberland, and Westmoreland. Their territory, therefore, would now embrace nearly all the great shipbuilding centres, as well as most of the large and most important iron and steel making districts of the kingdom; and it would be their object to develop these districts, so as to derive a large revenue from them, either by the establishment of subsidiary companies, or by granting licences for the use of the patents. Although they fully expected that they would secure a large revenue from the application of water gas to lighting purposes, he was of opinion that their great source of income would arise from its application to heating, in the manipulation of steel in smiths' and other open fires, and in boilers and furnaces of every description, as its applicability to these purposes was being rapidly proved by actual use. A water gas plant had been fitted up at Uddingston, about six miles from Glasgow, where the application of water gas to heating and lighting purposes could be seen; and as the works were the property of the parent Company, all the shareholders were freely invited to visit them. The time since they got into harness had been almost entirely occupied in getting their agreements put on a satisfactory footing, and in getting the concessions completed to which he had referred. They had now appointed a Manager to devote his entire time to the development of the business. They had had several promising inquiries, which would, he had little doubt, result in business, and he was glad to say that they had sold the right to use water gas in the manufacture of glass in Scotland for the sum of £5000. Mr. Cayzer, one of their Directors, he mentioned, had retired for private reasons.

Mr. S. Fox, the Manager of the Syndicate, made a long statement; and, alluding to the promotion of the North British Company, said that at the time the concern was formed, there was a change in feeling regarding water gas generally. A class of shareholders who seemed to have gone into the thing almost without considering whether it was a good investment or not, all at once appeared to lose their confidence in the value of the property they possessed, and began to sell. That led to a considerable fall in the shares. He knew that many shareholders had lost confidence in the concern, which some people had called a swindle. To that class of shareholders he said: "Give the men who know the subject thoroughly, and have confidence in it, a fair chance to prove what there is in the question." He had to say, for himself, that personally he was, perhaps, as large a buyer of the water gas shares as anyone. He had never sold a share, because he believed in water gas. In reply to a question, he said that the total sum to be paid by the Company, and the area of territory to be given, were matters which he had carefully gone into. These had been brought to a successful issue for the present Company; but no one had a right to know what had been paid over to one person or another.

Mr. Robertson: If, instead of £75,000, the sum of £250,000 had been paid, would you still maintain it would have been no concern to this meeting?

Mr. Fox: This gentleman assumes that a certain person did a certain class of work without knowing whether that was so or not.

Mr. Robertson: We want to know.

Mr. Fox: You cannot have any knowledge of the work done by the promoter, and you cannot have any right to know what price the persons who engaged him agreed to pay for his services, whatever these might be.

Mr. Cairney: Are the terms arranged with us as favourable as those with the Nottingham and Derby Company? They obtained a cash abatement.

The Chairman: Our terms are as good as theirs. Their area is very trifling as compared with ours.

Mr. Fox: It is not right to suppose we have foregone any of the total sum. The North British is entirely on the same footing. The parent Syndicate hold one-third of the capital of this Company; and they will see that this concern is worked for the benefit of them in the new and enlarged area.

A Shareholder: Is not this an arrangement to allow the Directors to unload? (Laughter.)

Mr. Fox: The original shareholders had their shares allotted to them; and they will be asked by circular at what price they will part with their North British shares, or such portion of them as we feel should be asked, up to the amount we require. We have a list of the original allotments, and we will give all a chance.

Mr. Bost: We were disappointed with the report of Mr. W. Foulis, the Gas Engineer of the Glasgow Corporation, who went to Leeds. I saw the water gas at the works in Leeds; and nothing it appeared to me could be more beautiful for illuminating purposes. Is there anything to prevent water gas being used in large or small cities?

Mr. Fox: There is nothing to prevent the use of water gas in small and large cities except prejudice. That will be overcome by the cheapness and purity of our gas for indoor lighting.

The Chairman said that if the shareholders wished it, they would light a hall in Helensburgh with water gas. If a deputation was sent to Uddingston, they would see the gas which the Company had arranged with the Caledonian Railway should be used to light one side of their station, and be able to contrast the light with the light from coal gas at the other side.

Mr. Robertson asked whether it would be convenient to tell why Mr. Cayzer had retired from the Board. The shareholders were much impressed by the names of the Directors. They were respectable and competent men; but suspicions had arisen that the shareholders had not obtained value for their money, and that there were dissensions amongst the Directors.

The Chairman said there were not.

A vote of thanks was accorded to the Chairman, and the proceedings then terminated.

THE EXAMINATIONS IN GAS MANUFACTURE.

In the Journal last week, we gave a list of the successful candidates at the examinations in Gas Manufacture held by the City and Guilds of London Institute this year. By the courtesy of the Honorary Secretaries (Messrs. John Watney and Walter S. Prideaux) we are enabled to reproduce the questions put to the candidates; and this will give those who are thinking of submitting themselves for examination on a future occasion an idea of the class of questions they may have to face.

Ordinary Grade.

1. What do you understand by high and low heats as applied to the working of retorts? 2. State in general terms the relative effect of the use of such heats in the distillation of ordinary coal. 3. What is the object of condensation? 4. What is meant by the terms "back pressure" and "exhaust?" 5. What constituents of the crude gas are removeable by the ordinary processes of purification? How would you prove their removal? 6. Name the principal purifying agents in general use, and describe the manner in which they are employed. 7. Name the two most prominent types of gas-burners. State which of them is capable of developing the highest illuminating power from a given quantity of gas. 8. Give a description of a pressure-gauge. What does its scale indicate? 9. What do you understand by the regenerative system as applied to the heating of retorts? 10. What is a jet photometer? Describe its use.

Honours Grade.

1. Describe some of the characteristics of a good gas coal. 2. Give a description of a wet gas-meter, illustrating it by a sketch of the measuring drum. 3. What amount of chimney draught is most suitable for the economical working of retort-furnaces? 4. What is a King's gauge? Describe its use. 5. Is the production of tar influenced either in quantity or quality by the temperature at which the coal is carbonized? If so, state in what way. 6. State, as briefly as you can, the difference in principle between the ordinary and the regenerative systems of heating retorts. 7. The bell of a governor is 3 feet in diameter. What must be its weight to give 16-10ths pressure at the outlet; the inlet pressure being 45-10ths? 8. What is the difference between a scrubber and a washer? Give a description of each form of apparatus. 9. Under what conditions is the illuminating power of coal gas best developed? Give illustrations. 10. How would you make quantitative tests for carbonic acid and sulphuretted hydrogen in coal gas? How much by volume of each would you expect to find in the gas before it reaches the purifiers?

THE FORTHCOMING MEETING OF THE BRITISH ASSOCIATION.

Great preparations are being made at Newcastle for the third visit of the British Association to that city; and if the meeting does not prove an exceptional success, it will certainly be from no lack of effort on the part of the local authorities. The previous visits to Newcastle were in 1838, under the presidency of the Duke of Northumberland, and in 1863, when Sir William (now Lord) Armstrong presided. It is safe to say that there will be very little (if anything) in the President's (Professor Flower's) address at the forthcoming meeting which will bear upon the industry with which the majority of our readers are connected; and the sectional addresses and papers will contain but little interesting matter. The Chemical Section will (as already stated in our columns) be presided over by Sir I. Lowthian Bell, and his address will be on a subject highly appropriate to the region in which the meeting will be held—namely, the "Progress of the Manufacture of Iron with and without the aid of Science." The President will adduce illustrations to contrast the slowness of this progress while science was unknown to the ironworkers, and the rapid advance it has made in recent times, when we began to study the laws which affect the operations connected with the working of iron. The general proceedings of this section will be marked by two important discussions—one in the Economical Section on the "Teaching of Chemistry," especially in schools, and the other in the Mechanical Section on "Blast-Furnaces," opened by Sir I. Lowthian Bell. Among other items, there will be a paper by Mr. Lowthian Bell (a son of the President) on the "Commercial Preparation of Chlorine in the Ammonia-Soda Process," and one on the "Utilization of Slag." In his address before Section G (Mechanical Science) the President (Mr. William Anderson) will devote the greater part of his address to a review of our knowledge respecting the molecular structure of matter and the importance of such knowledge to the right understanding of the properties and materials used in construction, and especially of the qualities of steel. He will also dwell on the importance of considering internal stresses, and the means by which their effects may be neutralized or rendered beneficial. Mr. Anderson will, besides, refer to the recent development of the use of petroleum as an illuminating agent and as a working substance in heat-engines; and will remind the section of Mendeleef's theory, which assigns to petroleum a mineral origin, rendering it possible that the supply can never be exhausted. Among the papers promised are the following:—"Water Gas in America," by Mr. A. C. Humphreys; "New Heat Engines," by Professor Hele Shaw; "Tests of Steel," by Mr. W. B. Marshall; "Dynamos," by Mr. J. Swinburne; and "Electric Treatment of Sewage," by Mr. W. Webster. Among the reports will be one by Mr. De Rance on "Underground Waters."

An Electric Lighting Inspector for Liverpool.—In the Journal last week, we announced that the Watch Committee of the Liverpool City Council had under consideration the appointment of an electric light inspector for the city. We learn that the selection has been made, and that Mr. E. H. Yeatman, of the Ward Electrical Car Company, is the successful candidate.

Additional Storeage for the Ossett Gas-Works.—Important extensions are being made at the Ossett Gas Company's works, in order to keep pace with the continuous increase in the consumption of gas. There being a deficiency of storeage room, a third gasholder is in course of construction, with a capacity of 450,000 cubic feet. The excavation for the tank of the holder has been proceeding for some time past, and is now almost completed. It involved the removal of about 12,000 cubic yards of material. The tank is being lined with brickwork 3 feet thick, with 2 feet of puddle backing. When finished, it will be 104 feet in diameter, and 28 ft. 6 in. deep. Messrs. Garforth are the contractors for the tank, and the whole of the work is being carried out under the supervision of Mr. W. Moys, Manager of the works. The holder itself will be a two-lift one, with wrought-iron columns and lattice girders, &c. A new valve-house, &c., are also being provided.

SHEFFIELD CORPORATION WATER SUPPLY.

The First Year's Accounts.

The annual abstract of the accounts of the Corporation of Sheffield, compiled by the Borough Accountant (Mr. W. Fisher Tasker, F.C.A.) has recently been issued in book form, and that gentleman has kindly favoured us with a copy. The volume is specially interesting on this occasion, seeing that it contains the financial results of the first entire year's working of the water undertaking under the management of the municipal body. On the 25th of March last year, the Committee had only been in possession of the works for three months; and the figures now before us relate to the period extending from that date to the 25th of March this year. In the statement of the income and expenditure for the twelve months, we find that the former amounted to £93,205; and the latter to £93,264—showing a net loss of £59. After providing for interest on unproductive capital and the sinking and loans funds, the excess of expenditure over income is £5513. Of course, the principal disbursements are in respect of annuities and interest account. The annuities absorb £52,901; and interest, £18,679. In regard to the capital account, the outlay to March 25, 1888, amounted to £2,088,872; and at the corresponding date of the current year (including the stock of materials, which are booked at £3213), the expenditure stood at £2,107,837. At the close of the volume, the Borough Accountant gives some miscellaneous statements in regard to the water-works. One very interesting table is that showing the income, expenses, &c., of the defunct Company from 1864 to 1887. In the first-named year the income was £27,635; and by progressive steps it reached, in 1887, £83,310. On only two occasions during the past quarter of a century did the income make a serious retrograde movement. In 1873, the figure was £51,946, while in the previous year it was £54,573; and in 1877 £65,768 was received, against £66,917 in the preceding twelve months. The working expenses rose from £6525 in 1864 to £14,223 in 1887—showing that, whereas the income has more than trebled during that period, the working expenses have little more than doubled. The dividends on preference shares and interest on loans absorbed only the modest sum of £2248 in 1864; but in 1887, £63,115 were required to meet these payments. The troubles which overtook the Company (and with which our readers are well acquainted) are portrayed in the column headed profit to ordinary shareholders. In 1864, the profit was £16,861 and then the figures fluctuate by £2000 or £3000 each year until we arrive at 1881, when the item stood at £15,069. In the following year it fell as low as £4443, and another drop of £600 was experienced in the next twelvemonth. An improvement succeeded; and in 1886 the profit amounted to £8224. In 1887, however, there was a fall to £5970. A vast amount of other information relating to the water undertaking is given in the pages of Mr. Tasker's carefully-prepared abstract; but the figures have more of local than general interest.

CAPE TOWN DISTRICT WATER-WORKS COMPANY.

The Statutory Meeting of this Company was held last Tuesday, at Winchester House, Old Broad Street, E.C.—Mr. J. P. Prince in the chair.

The Secretary (Mr. G. H. Rippin) having read the notice calling the meeting,

The Chairman said the meeting was merely a formal one, and therefore he should not detain the proprietors for long. The Company, he proceeded, was registered on May 1; and all the shares were allotted, and the authorized amount of debentures subscribed for. Since then they had received advices from the local Directors in Cape Town that the property has been duly transferred and registered in the name of the Company, with the Company's bankers in Cape Town. A contract had been entered into with Mr. Delbridge for the construction of the works; and on July 13 the first sod was turned. Mr. Ackerman had been engaged as Resident Engineer, and a competent Clerk of Works was dispatched from England, and had already arrived in the colony. About 1100 tons of pipes and fittings had been shipped; and the pumping-engines were to be ready for shipment early in November. It would thus be seen that the Directors had lost no time in pushing on the works with vigour. Their Engineer in Cape Town reported that he had commenced to develop the springs with a view of opening them up at as high a level as possible, so as to be able to supply a larger quantity of water by gravitation, and thus lessen the cost of pumping, which, in any case, was only expected to be required during the summer months. His first trials had been quite successful; and he was now endeavouring to strike the water-bearing strata some 400 feet farther up the mountain side. Negotiations were being actively carried on by the local Directors with the Government for the supply of water to the railway works, and also two additional Municipalities, who had approached the Company on the subject of a supply. From these remarks it would, he said, be seen that the Company started under most favourable circumstances, and that there was every prospect of eminent success, with a gradually progressive revenue. He (the Chairman) had resided in the suburbs of Cape Town for above 30 years; and therefore knew the great difficulties the inhabitants experienced in obtaining the necessary water, which was chiefly derived from wells. These sometimes failed altogether, and in dry seasons not unfrequently became unfit for use. Judging, therefore, from his personal observation, he felt more than confident that a large demand would spring up for supplies of water by the Company, and that any reasonable rate charged would cost the consumer far less than the repairs of pumps and the labour employed in drawing the water from wells, to say nothing of the inconvenience of having to carry it from a distance when the wells failed, as they did not unfrequently.

Mr. Ohlsson said that Mr. Prince had stated nothing but the facts with regard to the necessity of a supply of water at Cape Town. As to the Company's vendor, he (the speaker) had been very guarded in his statements; but having been a resident for 25 years in Cape Town, and being a member of Parliament representing the City of Cape Town, he could say that the want of water was so urgently required for the suburbs that he thought, if he could be the means of procuring water, he would be a public benefactor. That being so, he offered a certain portion of his property in water rights to the Company; but, besides, his other water rights had been acquired by the Company. He believed that these water rights were sufficient, by opening up springs, to supply not only the suburbs, but Cape Town as well; and he was of opinion that the asset would prove a valuable one. The question of the water supply of Cape Town and the suburbs had from time to time been brought before the Colonial Parliament; and the session before last a very large Committee was appointed to make inquiries with regard to the water supply amd the sanitary arrangements of Cape Town and the suburbs. This Company having been formed, he believed it was merely a matter of time to make it a success. They had got at the present time a concession from Clare mont and Woodstock, and they had also obtained a concession to supply another divisional council which only required water for road-watering purposes. Another municipality was undecided whether to take water from the Company or to get a water scheme of their own. They had been in negotiation with them, and at present the only difference between them was the question of price. The price charged by the Company was a very reasonable and moderate one; and he would not recommend any concession being made to them. He did not think they should expect a very good dividend to begin with because it would take some time before they could supply all the houses; but before long they would see that their water revenue would increase considerably. He thought the Company had fair prospects.

Sir Richard Meade asked whether there was any prospect or expectation of water-rates being made compulsory in the case of buildings which were supplied by the Company, or whether the rates were entirely voluntary.

Mr. Ohlsson, in reply, said that the municipality of Woodstock, which was the first to give a concession to the Company, passed a Bill which made it compulsory for every house to take water from the Municipality of not less than 50 gallons for every house. With regard to Claremont, as there was an uncertainty whether the Company would be floated or not, they had not yet passed any Bill; but now that it was floated, he was sure before long they would see the necessity of passing a Bill.

An extraordinary general meeting was then held for the purpose of passing the following resolution:—"That the Articles of Association be altered by substituting the following article for Article 83—namely, 'The qualification of every Director shall be the holding in his own right of shares or stock of the Company of the nominal value of £250.'"

The Chairman formally moved the resolution, which was seconded by Sir R. Meade, and adopted.

THE PROPOSED TRANSFER OF THE WELLS WATER-WORKS TO THE CORPORATION.

Last Tuesday, Major-General C. Phipps Carey, R.E., one of the Inspectors of the Local Government Board held an inquiry at Wells relative to an application by the Town Council to borrow £17,000 for the purpose of acquiring the property of the Water Company. The Inspector, in opening the proceedings, asked if there was any opposition to the scheme, and was answered in the negative. He then proceeded to take evidence, from which it appeared that the last census was 4684, and it was about the same now. The population did not increase or decrease much; there being a difference of only 5 between the census of 1871 and 1881. The rateable value was £14,999. The Water Company now supplied the greater part of the town. The Company was formed in 1872, with a capital of £5000; and the shares (£5) were fully paid up. The whole of the capital had been spent on the undertaking. The gross yearly revenue was about £700. The average expenditure was something like £300 per annum, and with dividends of about £690. A sum of £74 per year was paid to Lord Brougham as water-rent; and this was a perpetual rent-charge. The works were very simple; the supply being by gravitation. There was one service reservoir, which was 500 feet above the level of the town. The reservoir had a capacity of 155,250 gallons. When the spring was gauged a few days ago, it yielded 250,000 gallons per day. The Council entered into a provisional agreement with the Company on May 17 last to purchase the works for the sum of £15,000; but the Council would not borrow the money unless they could have it for a period of 50 years. Mr. Welsh, the Chairman of the Company, refused to state what the valuation of £15,000 was based on. The Inspector said, if there was no reason for such concealment, it would be far more satisfactory to see the valuation. The Council thought the price of £15,000 excessive. They considered £12,000 was a fair price; but were willing to give £15,000 rather than the undertaking should slip from them. If they purchased the works, they contemplated spending £1000 in improvements and additions. Mr. G. Slade, a ratepayer, asked if the ratepayers had been consulted; and the Mayor replied that he had refused to call a public meeting unless compelled. The last public meeting really cost them £10,000; for when the town had the chance of purchasing the works 18 years ago they refused. Mr. Welsh said he brought the matter forward 20 years ago; and he was told to form a company, which he had done. Had the town then taken the matter up, they might now have been in receipt of £400 a year. The inquiry lasted nearly three hours. Before leaving the town, General Carey visited the reservoir and springs; and it is believed, should the Local Government Board grant the application, that he will recommend the Board to sanction the borrowing of £16,000, and not £17,000. The Council contemplated using the extra money for sewerage purposes.

THE NEW ACT OF THE BELFAST WATER COMMISSIONERS.

As we intimated in our "Parliamentary Intelligence" last week, the Bill promoted by the Belfast Water Commissioners in the present session has now become law, having received the Royal Assent on the 12th ult. The powers conferred by the Act are wide in character; and it is hoped that, when put into operation, they will be found convenient to the Commissioners, and of great advantage to the ratepayers. The principal matters dealt with by the Act are as follows:—(1) The construction of works for the filtration of the entire supply to the city and suburban districts, and power to acquire compulsorily the lands necessary. (2) The assimilation of the franchise for the Water Board with that of the Belfast City Council. (3) The consolidation of the debts under the various Acts, and provision for repayment of the same within 49 years. (4) Provision for borrowing money for new works, and for the repayment of the same within a period of 60 years. (5) Power to create and issue stock to replace existing mortgages. The financial re-arrangements will prove of great benefit to the ratepayers, in that it will place a fair share of the liability in respect to the capital cost of the works upon future generations. The net saving to the present ratepayers will be £3530 a year. It is also hoped that the power of creating and issuing stock will prove valuable, and enable the Commissioners to float their entire debt at 3½ per cent. A saving in interest of about £2600 a year may be effected in this way; but this will be spread over a number of years, as the change can only be made as the existing mortgages fall in. The Law Committee of the Commission who had charge of the Bill, endeavoured by its means to empower trustees to invest trust funds in the Commissioners' mortgages or stock. This proposal was objected to by the late Chairman of Committees in the Lords, and also by the Irish Lord Chancellor; and the proposal had to be abandoned. A Public Bill, called the "Trust Funds Investment Bill," was, however, shortly afterwards introduced into the House of Commons. This Bill, which has since become law, enumerates the different classes of securities in which trustees may invest trust money, and contains a clause which will enable trustees to place trust money in the water stock of the Commissioners. This provision, the Committee believe, will raise very considerably the value of the Commissioners' stock, and will ensure it being taken up quickly. In recognition of the wider jurisdiction now exercised by the Commissioners over the districts beyond the city boundaries, the new title of the Commissioners under the Act will be the Belfast City and District Water Commissioners.

At a recent meeting of the Southampton Town Council, on the recommendation of the Water Committee, it was decided to increase the adits at Otterbourne to 14 feet in depth, at an estimated cost of £800.

NOTES FROM SCOTLAND.

FROM OUR EDINBURGH CORRESPONDENT.)

EDINBURGH, *Saturday*.

In prosecution of the scheme for introducing gas lighting into Downfield, a rather distant suburb of Dundee, a bazaar was held at the end of last week to raise funds; there being no public body in the district entitled to impose a charge upon the inhabitants. By this means a sum of £257 was realized, and the place will this winter be lighted, the Dundee Gas Commission supplying the gas. Lord Provost Hunter, of Dundee, who opened the function on the first day, spoke rationally of the arrangement which the Gas Commission had made with the Committee of inhabitants. On the second day, however, Mr. W. Longair, in his remarks at the opening, seemed to forget that he also was a member of the Dundee Gas Commission. Both by precept and practice, he said he was the advocate of a newer and better method of lighting than by gas. Some of those present were perhaps not aware that the first quarter of this century had passed before gas lighting became general in large cities and towns; and he thought it was not a great venture at prophecy to say that probably before the century closed it would be practically, if not entirely, superseded by a more excellent method. He believed that as certainly as the locomotive could beat the carrier's cart, so in the near future electric lighting would supersede lighting by gas. Already applications were before the Gas Commissioners from two Companies asking power to light Dundee by electricity; and he trusted the policy of the Commissioners would be to forward, and not hinder, the movement. This does not look like the words of one who was consumed with a desire to improve the business which the people of Dundee appointed him to look after on their behalf. Mr. Longair is entitled to his opinion about electricity, even while remaining on the Gas Commission; but until the Commission agrees, by his persuasion or otherwise, to adopt it as a lighting medium, it gives him the character of a "traitor in the camp" to begin preaching to the public in favour of electric lighting.

The public authorities of Banff—the Town Council, Police Commissioners, and Road Trustees—met on Thursday to consider the condition of the gas-mains; this step being taken in consequence of an explosion under the roadway at the end of July. Provost Smith, the originator of the present movement, seems to have a very decided antipathy to the Gas Company; and he succeeded in carrying his brother counsellors, with the exception of one, who is apparently a shareholder in the Company, along with him. The Provost talked largely upon the unrestricted use which the Gas Company made of the streets, with which he contrasted the treatment shopkeepers get, in being barely allowed to unpack a bale or box of goods without being subjected to a penalty. Bailie Henry Munro, who championed the Gas Company, informed the meeting that the Company had instructed that their plant should be inspected by a practical man in the sight of two Directors, and that the Manager had tendered his resignation. The latter announcement may be the key to the whole situation. With a new Manager, the attitude of parties may undergo a change, and things go smoother. Very little was said at the meeting regarding the condition of the gas-mains; but it was resolved to request the Gas Company to have their plant, in so far as laid or placed under public streets or highways, inspected by a neutral practical man, and that the Commissioners be represented by two members at the inspection.

The Peebles Gas Company have reduced the price of gas from 5s. to 4s. 7d. per 1000 cubic feet.

(FROM OUR GLASGOW CORRESPONDENT.)

GLASGOW, *Saturday*.

I understand that an important salaried office will shortly be at the disposal of the Glasgow Corporation, as Mr. Alexander Ross, Treasurer to the Gas Commissioners, has officially intimated his wish to retire from active service. Beginning with the Glasgow Gaslight Company (generally called the "Old Gas Company"), and being taken over as a permanent officer when the Corporation Gas Act of 1869 came into operation, Mr. Ross has now had about 26 years' experience of the city's gas supply undertaking. As an old servant, he is, I think entitled to receive a retiring allowance from the fund laid aside for the purpose. I am told that his salary for some time past has been £1000 a year; but it has been stated at £700. It is alleged that one of the reasons which Mr. Ross gave the Corporation Gas Committee for his resignation was that he thought it was time for his principal assistant, Mr. James Fleming, to get promotion. There are many other persons besides Treasurer Ross who entertain the same opinion as to Mr. Fleming, who has long proved himself to be a most diligent, efficient, and faithful servant of the Gas Trust. He thoroughly deserves promotion; for nobody knows the work of the Treasurer's department better than he.

The manufacture of water gas has now actually been started at the Uddingston Engineering Works, which had been secured by Mr. Samson Fox and fitted up with the necessary plant. A large lamp has been erected at the entrance to the works; and this is lighted with the new gas. An Uddingston paragraph in one of the local papers says that the gas "gives a splendid, brilliant light, without the flickering present in a coal gas light; and though the arrangement of magnesia combs, to which the light owes its brightness, is not particularly neat when the light is out, still the light must be pronounced a great success, and crowds have visited the vicinity every night this week. An offer to the Caledonian Railway Company to light the Uddingston Station, close by, with the new gas free of charge, has been accepted in part; the Railway Company granting permission to Mr. Fox to light the north platform, the other to remain lighted with ordinary coal gas as supplied by the Bothwell and Uddingston Gas Company. The experiment began last night; and much interest was displayed in connection with it by the passengers arriving at or departing from the station.

I am told that the Glasgow Corporation Gas Committee has lately been considering the question of applying to the Board of Trade for an Electric Lighting Provisional Order. It is not unlikely that a personal interview may be had with the Secretary of the Board of Trade by two or three representatives of the Corporation before application is formally made; and I am given to understand that the sort of action resolved on by the Glasgow authorities will most likely serve as a guide to other Gas Corporations in Scotland when they proceed with their applications for Provisional Orders empowering them to provide and supply electricity for lighting or other purposes.

This has been a very satisfactory week in the Glasgow pig iron market. The briskness reached its highest point on Wednesday, when the price of Scotch iron went to the top level of the year—46s. 10½d. per ton cash. Yesterday afternoon, at the close of the market, the price was 46s. 7½d. per ton cash buyers. Coltness No. 1 special brand has been quoted at 62s. per ton; being an advance of 2s. on the week.

A further advance in the price of coal has been announced. In most instances 3d. per ton has been added to the price, and household coal is likely to be dearer in the beginning of the ensuing week, as miners' wages have in many instances been raised.

THE PUBLIC LIGHTING OF WESTMINSTER.—The report of the Vestry of St. Margaret and St. John, Westminster, for 1888-9 shows that for lighting the public lamps throughout the parish, for providing and maintaining the lamp-posts and lanterns, and for all other purposes connected with the public lighting, the Vestry expended in the twelve months the sum of £4728 18s. The Gaslight and Coke Company have continued to supply the parish with gas at the rate of 2s. 2d. per 1000 cubic feet.

THE PROPOSED PURCHASE OF THE BOURNEMOUTH GAS AND WATER WORKS BY THE COMMISSIONERS.—Last Tuesday, being a month since the public meeting was held for the purpose of considering the proposal to purchase the gas and water works (*ante*, p. 323), the adjourned meeting of ratepayers was held, in accordance with the decision then arrived at. Mr. W. Fisher, Chairman of the Improvement Commissioners, presided, and there was a crowded attendance of ratepayers. The utmost interest was evinced in the proceedings. The first speaker was Mr. Fyler, who said it appeared to him that those who supported the transfer of the gas and water works were rather blind to the terms on which the contract had been made; and he also thought that they had placed too much weight on expert evidence. Dr. Clegg made a long statement in support of the purchase. Mr. Carr Gibbs said the Commissioners were proposing to take a large business out of the hands of practical men, and hand it over to men who did not know the inner life of the gas world. The time, he thought, had not arrived for the town to purchase the undertaking. They had, in the first instance, to pay the very "tip-top" price; and his own opinion was that the whole of the profitable gas-mains to be laid down in Bournemouth were down now. Moreover the Commissioners were not unanimous on the question of purchase. Mr. E. L. Lane stated that he was perfectly satisfied that the figure the Commissioners had placed before them was a fair price to be paid for so flourishing a concern. The Rev. R. Colman observed that he had looked into the matter carefully during the past four weeks, and had come to the conclusion that they were buying a property which was certain to develop to a large extent, and that the price to be paid was a reasonable one. The nominal value of the shares was £190,000; but, as they knew, that was not the real value of them. The true value according to the market price—the highest market price obtained of recent years—was £340,000. They were asked to pay a premium practically of £60,000. The sum suggested was a low figure; and they would act wisely if they agreed upon it. Other speakers addressed the meeting; and on the resolution approving of the transfer of the works being put, it was carried by an enormous majority. Mr. Carr Gibbs demanded a poll, which was assented to; and the necessary steps for carrying it out will shortly be taken.

GAS AND WATER COMPANIES' STOCK AND SHARE LIST.

(For STOCK MARKET INTELLIGENCE, see *ante*, p. 448.)

Issue.	Share	When ex-Dividend.	Dividend or Div. & Bonus.	NAME.	Paid per Share	Closing Prices.	Rise or Fall in Wk.	Yield upon investment.
£			p. c.	GAS COMPANIES.				£ s. d.
590,000	10	11 Apr.	10½	Alliance & Dublin 10 p. c.	10	19—20	..	5 5 0
100,000	10	„	7½	Do. 7 p. c.	10	13—14	..	5 7 2
900,000	100	1 July	5	Australian (Sydney) 5% Deb.	100	109—111	..	4 10 1
100,000	20	30 May	10	Bahia, Limited	20	26—28	..	7 2 10
200,000	5	15 May	7½	Bombay, Limited	5	7—7½	..	5 0 9
40,000	5	„	7½	Do. New	4	5—5½	..	5 0 4
880,000	Stck.	14 Aug.	12½	Brentford Consolidated	100	228—238	+1	5 5 2
125,000	„	„	9½	Do. New	100	163—167	..	5 10 6
220,000	20	14 Mar.	10½	Brighton & Hove, Original	20	43—45	..	4 13 1
320,000	20	28 Mar.	11½	British	20	45—47	..	4 15 0
50,000	10	14 Mar.	11	Bromley, Ordinary 10 p. c.	10	20—22	..	5 0 0
89,000	10	„	8	Do. 7 p. c.	10	13½—14½	..	5 10 0
328,750	10	30 May	10	Buenos Ayres (New) Limited	10	14½—15½	..	6 9 1
200,000	100	1 July	6	Do. 6 p. c. Deb.	100	106—109	..	5 10 6
150,000	20	14 Aug.	8	Cagliari, Limited	20	25—27	..	5 18 4
550,000	Stck.	11 Apr.	13½	Commercial, Old Stock	100	269—274	..	5 0 8
180,000	„	„	10½	Do. New do.	100	213—218	..	4 18 0
180,000	„	28 June	4½	Do. 4½ p. c. Deb. do.	100	122—125	..	3 12 4
557,320	20	14 June	13	Continental Union, Limited	20	46—48	..	5 8 4
242,680	20	„	13	Do. New '69 & '72	14	33—34	..	5 6 7
200,000	20	„	10	Do. 7 p. c. Pref.	20	37—39	..	5 2 6
75,000	Stck.	28 Mar.	10	Crystal Palace District	100	204—208	..	4 16 2
234,060	10	26 July	13	European, Limited	10	24½—25½	..	5 1 11
120,000	10	„	13	Do. New	7½	17—18	..	5 7 10
354,060	10	„	13	Do. do.	5	12—12½	..	5 3 9
5,470,040	Stck.	14 Aug.	13½	Gaslight & Coke, A, Ordinary	100	260—264	..	5 4 1
100,000	„	„	4	Do. B, 4 p. c. max.	100	100—105	..	3 16 3
665,000	„	„	10	Do. C, D, & E, 10 p.c. Pf.	100	254—259	..	3 17 3
80,000	„	„	5	Do. F, 5 p. c. Prf.	100	128—128	..	3 18 1
60,000	„	„	7½	Do. G, 7½ p. c. do.	100	182—187	..	4 0 4
1,300,000	„	„	7	Do. H, 7 p. c. max.	100	166—171	..	4 1 10
463,000	„	„	10	Do. J, 10 p. c. Prf.	100	253—258	..	3 17 6
1,051,150	„	14 June	4	Do. 4 p. c. Deb. Stk.	100	121—124	..	3 4 6
294,850	„	„	4½	Do. 4½ p. c. do.	100	127—131	..	3 8 8
650,000	„	„	6	Do. 6 p. c. do.	100	171—175	..	3 8 6
3,600,000	Stck.	15 May	10	Imperial Continental	100	210—214	..	4 13 5
75,000	5	14 June	6	Malta & Mediterranean, Ltd	5	5—5½	..	5 9 1
560,000	100	1 Apr.	5	Met. of Melbourne, 5 p.c. Deb.	100	115—117	..	4 5 6
541,920	20	14 June	6	Monte Video, Limited	20	21—22	..	5 9 1
150,000	5	30 May	10	Oriental, Limited	5	9—9½	..	5 5 8
60,000	5	28 Mar.	7	Ottoman, Limited	5	6½—6¾	..	5 3 5
166,870	10	26 July	4	Pará, Limited	10	5—5½	..	7 5 3
420,000	100	2 May	6	People's Gas of Chicago— 1st Mtg. Bds.	100	103—107	..	5 12 1
500,000	100	1 June	6	2nd Do.	100	98—102	..	5 17 8
100,000	10	26 Apr	10	San Paulo, Limited	10	17½—18½	..	5 8 1
500,000	Stck.	29 Aug.	16½	South Metropolitan, A Stock	100	811—816*	..	5 2 10
1,350,000	„	„	12½	Do. B do.	100	236—240*	..	5 1 0
141,500	„	„	13½	Do. C do.	100	250—260*	..	5 1 11
600,000	„	28 June	5	Do. 5 p. c. Deb. Stk.	100	139—143	..	3 9 11
60,000	5	28 Feb.	11½	Tottenham & Edm'ntn, Orig.	5	11—13	..	4 8 5
				WATER COMPANIES.				
717,467	Stck.	14 June	9½	Chelsea, Ordinary	100	278—278	..	3 8 4
1,720,560	Stck.	11 Apr.	7½	East London, Ordinary	100	214—219	..	3 8 6
544,440	„	28 June	4½	Do. 4½ p. c. Deb. Stk.	100	143—146	..	3 1 7
700,000	50	14 June	9	Grand Junction	50	127—132	..	3 8 3
708,000	Stck.	29 Aug.	10½	Kent	100	276—281*	+1	3 14 9
1,043,800	100	28 June	9	Lambeth, 10 p. c. max.	100	261—266	..	3 7 8
406,200	100	„	7½	Do. 7½ p. c. max.	100	200—203	..	3 13 10
200,000	Stck.	28 Mar.	4	Do. 4 p. c. Deb. Stk.	100	120—123	..	3 5 0
500,000	100	14 Aug.	12½	New River, New Shares	100	860—865	..	3 6 5
1,000,000	Stck.	26 July	4	Do. 4 p. c. Deb. Stk.	100	127—130	+1	3 1 6
902,300	Stck.	28 June	6	S'thwk & V'xhall, 10 p.c. max.	100	181—186	..	3 4 6
1,126,500	100	„	6	Do. 7½ p. c. do.	100	168—173	..	3 9 4
155,066	Stck.	14 June	10	West Middlesex	100	267—272	..	3 13 6

*Ex div.

CURRENT SALES OF GAS PRODUCTS.

LIVERPOOL, *Aug.* 31.

Sulphate of Ammonia.—There has been more activity; and both dealers and consumers have been buyers of immediate parcels at advancing rates. The demand has apparently been stronger than was anticipated; and the small supplies in the country, coupled with the difficulties of shipment from London, have naturally had an effect on values. This urgency of demand may continue for awhile, in which case values would no doubt be further enhanced. The market closes to-day from £12 5s. to £12 7s. 6d. at the various ports. It may be worth while to call attention to the great disparity between nitrate and sulphate prices; the latter being nearly £4 per ton (ton for ton) dearer than the former—displaying a lack of sympathy between the two commodities, which has so frequently been, and probably will continue to be the case. It is evident that only at certain stages of the market, one will influence the other. The shipments and loadings of nitrate are in excess of last year. The market, however, keeps firm; and a lower range of prices seems improbable.

LONDON, *Aug.* 31.

Tar Products.—Benzoles are not quite so firm at the moment of writing; and there is a feeling that prices are likely to droop. Other tar products are in good demand; and the lower price quoted for anthracene has at last brought buyers—some good business in this article having taken place during the past week. Carbolic acid is not quite so firm; but large business is being done. Creosote oil is scarce, as is usual at this time of the year. Prices: Tar, 21s. to 27s. 6d. per ton, according to position. Benzole, 90 per cent., 3s. 1d. per gallon; 50 per cent., 2s. 4d. per gallon. Toluol, 1s. 6d. per gallon. Solvent naphtha, 1s. 4d. per gallon. Crude naphtha (30 per cent.), 1s. per gallon. Light oil, 3¼d. per gallon. Creosote, 2¼d. per gallon. Pitch, 22s. to 23s. 6d. per ton. Carbolic acid (60's), 3s. 7¼d. per gallon. Cresylic acid, 10d. per gallon. Tar salts, 15s. to 20s. per ton. Anthracene (30 per cent.), "A" quality, 1s. 1d. per unit; "B" quality, 10d. per unit.

Ammonia Products.—Sulphate is scarce; and decidedly dearer. The production is now small, and stocks are absolutely cleaned out. The demand is especially good for the time of year; and large business has been transacted at £11 17s. 6d. to £12 5s. per ton according to position. Gas liquor (5° Twaddel), 7s. to 8s. per ton, with a rise or fall of 1s. 6d. per degree. Liquor ammonia, 1¼d. per lb. Carbonate of ammonia, 8d. to 3¼d. per lb. Muriate of ammonia, brown, £18 10s. per ton; white, £23. Sal-ammoniac, £30 to £32 per ton.

THE INTEREST ON THE VYRNWY WORKS.—At their last meeting, the Liverpool Water Committee passed a resolution recommending the Council to apply to Parliament in the ensuing session for power to borrow, on the water account, a sum equal to the interest that has been paid out of revenue on the capital expended on the Vyrnwy works during the construction of the works, and that such sum be applied to revenue during not exceeding the next 15 years in such instalments as the Committee may hereafter decide.

LANCASTER CORPORATION WATER SUPPLY.—Upon the reading of the minutes of the Water Committee at the meeting of the Lancaster Town Council last Wednesday, Mr. Bell asked if the contribution of £500 usually made to the borough fund had been omitted this year. Upon receiving a reply in the affirmative, Mr. Bell moved as an amendment that the minutes be passed with the exception of that relating to the disposal of the balance in hand, which should be referred back to the Committee. Mr. Kitchen seconded the amendment, which was agreed to.

NORTHERN COAL TRADE.—There has been a decidedly easier feeling in the coal trade of the north-east, and that chiefly because of the stoppage of coal for London. The steam coal trade has been less affected than that for gas and household coal. Best Northumbrian steam continues steady at about 9s. 9d. free on board; but there is not so long a turn at the collieries. Second-class steam is more varied, at from 8s. 6d. to 9s. 3d. Small coal is in good demand. Though much gas coal has been kept back that would have been sent to the Metropolis, more has been exported, and more has been sent to coasting ports and inland; so that the pits have not had much idle time generally. The price asked for odd cargoes of best gas coal is 9s.; and some anticipate that the rate will be 10s. within six weeks. Household coal is very depressed; and the price is weak. There is a very fair demand for manufacturing and bunker coal. For coke, a brisk inquiry prevails. Gas coke is scarce; and about 8s. per ton is now the current price; the cement works having large contracts running.

KNARESBOROUGH AND THE BRADFORD WATER-WORKS EXTENSION.—The Bradford Corporation having decided to take the requisite proceedings for the extension of their water-works by going to the Nidd district, the Knaresborough Local Board are apprehensive the scheme is one calculated seriously to affect the inhabitants; seeing that the Nidd is the only source from which the town is supplied with water. The Board are alive to the importance of the matter, and held a special meeting yesterday week to consider the position in which they will be placed, so that the future interests of the town may not in any way be prejudiced by the action of the Corporation; and unless some guarantee can be given that there will be no decrease in the present supply of water, the proposal is one that will be met by the most strenuous opposition when the Bill comes before Parliament. The Commissioners have placed themselves in communication with the Bradford Corporation on the subject of a proposed interview between the two bodies. The Town Clerk of Bradford (Mr. W. T. M'Gowen) has replied that the Water Committee will not meet till next Friday, and that he will then ask for a deputation to be appointed and arrange for an interview.

GWYNNE & CO., ESSEX STREET WORKS, VICTORIA EMBANKMENT, LONDON, W.C.

GWYNNE & BEALE'S PATENT GAS EXHAUSTERS & ENGINES.

Telegrams: "GWYNNEGRAM, LONDON." Telephone No. 2698.

Exhausters of nearly all sizes in Stock.

Prize Medals at all the Great International Exhibitions.

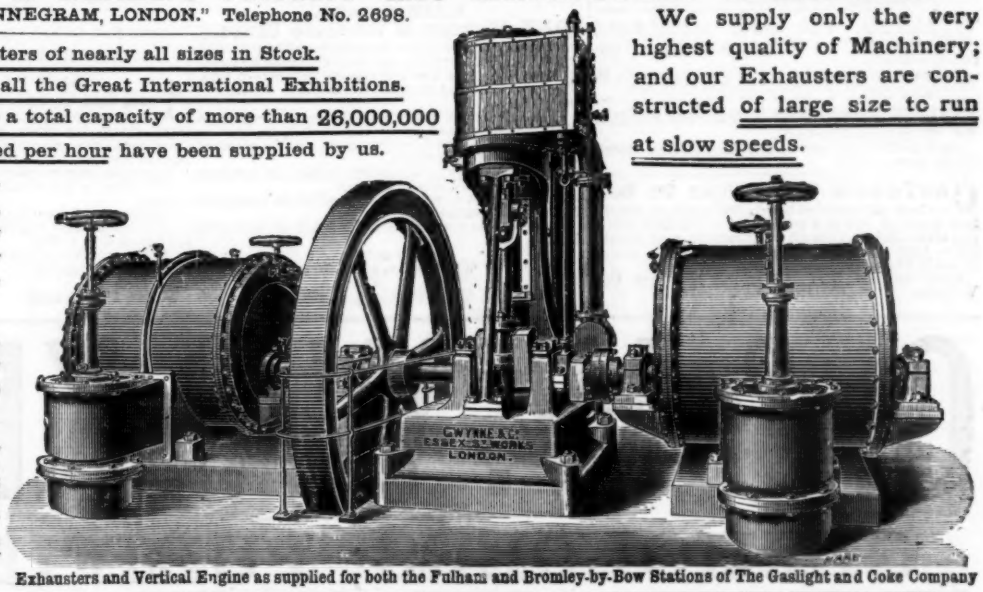
Exhausters equal to a total capacity of more than 26,000,000 cubic feet passed per hour have been supplied by us.

Our new Patent Non-Fluctuating Exhausters, to work without the slightest oscillation or variation in pressure, are strongly recommended.

MAKERS OF EVERY DESCRIPTION OF HYDRAULIC AND GAS MACHINERY.

Gwynne & Co.'s New Catalogue and List of Testimonials can now be obtained on application.

We supply only the very highest quality of Machinery; and our Exhausters are constructed of large size to run at slow speeds.



Exhausters and Vertical Engine as supplied for both the Fulham and Bromley-by-Bow Stations of The Gaslight and Coke Company

OXIDE OF IRON.

O'NEILL'S Oxide has a larger annual sale in the United Kingdom than all other Oxides combined. Purity and uniformity of quality guaranteed. Pamphlet, "How to Purchase Bog Ore," to be obtained on application.

Gas Purification and Chemical Company, Limited, Palmerston Buildings, Old Broad Street, London, E.C.
JOHN WM. O'NEILL, Managing Director.

ANDREW STEPHENSON, Agent for the GAS PURIFICATION AND CHEMICAL COMPANY, Limited, Palmerston Buildings, Old Broad Street, LONDON, E.C.

CANNEL COAL, ETC.

JOHN ROMANS & SON, EDINBURGH. Gas Engineers, supply all the most approved SCOTTISH CANNELS; also FIRE-CLAY GOODS, CAST-IRON PIPES, and other APPARATUS for GAS AND WATER WORKS.

Prices, &c., will be forwarded on application to No. 30, ST. ANDREW SQUARE, EDINBURGH, / No. 54, BERNARD STREET, LEITH, } SCOTLAND.

TIMMIS & CO., of STOURBRIDGE Make only the best quality of FIRE-CLAY RETORTS, BRICKS, TILES, & LUMPS. Also SPECIAL SILICA BRICKS, to stand great heats. All descriptions kept in Stock.

For Prices apply to JAMES LAWRIE AND CO, 1, Whittington Avenue, Leadenhall Street, E.C., Sole Agents for London and District.

Telegraphic Address: "EIRWAL, LONDON."

W. C. HOLMES & Co., Huddersfield, AND 80, CANNON STREET, LONDON, Contractors for Gas-Works complete, Makers of Gasholders, Purifiers, Scrubbers, Condensers, Retort Fittings, &c., Improved Valves, Engines, and Exhausters. Also for Collingwood's Regenerative Retort-Settings.

*** See Advertisement p. 483 of this week's issue.

Cablegrams: "Ignitor London." Telegrams: "Holmes Huddersfield."

J. & J. BRADDOCK, Globe Meter Works, Oldham.

First-Class Award, Melbourne Exhibition, 1889, for Wet and Dry Gas-Meters, Station Meters, and Governors, Pressure-Gauges, Street Lamps, and Pillars, &c.

Telegraphic Address: "Braddock, Oldham."

IRISH BOG ORE OXIDE OF IRON.

GAS PURIFICATION.

BALE, BAKER, & CO., direct Importers from Ireland. Sample and Price on application. Spent Oxide and Sulphate of Ammonia purchased.

120 and 121, NEWGATE STREET, LONDON, E.C.

TUBES.

FOR Gas, Steam, and Water; Galvanized, White Enamelled, and Hydraulic Tubes and Co. JOHN SPENCER, Globe Tube Works, WEDNESBURY, and 14, Great St. Thomas Apostle, LONDON.

SULPHURIC ACID.

JOHN NICHOLSON & SONS, Chemical Works, LEEDS, specially produce this ACID for making SULPHATE OF AMMONIA of high quality and colour. *Delivery in Railway Tank-Wagons or Carboys.*

Highest References and all particulars supplied on application.

SHIPPING AND INSURANCE.

FOR Rates of Freight, &c., apply to ROBERT BRUCE FITZMAURICE, 9, Crosby Square LONDON, E.C.

SULPHURIC ACID, B.O.V., for Sulphate of Ammonia Making. Guaranteed clear, of full strength, and to produce a fine white-coloured salt. Delivered in carboys or railway tank waggons.
For prices and terms address BALE, BAKER, AND Co., 120 & 121, Newgate Street LONDON.

HUTCHINSON BROTHERS, Barnsley, Gas Engineers and Contractors, Makers of Gas-Meters and General Gas Apparatus, Sulphate of Ammonia Plant, Tools, and Sundries.
*** See large Advertisement in last week's issue, page 392.

JOHN RILEY & SONS, Chemical Manu. facturers, Hapton, near Accrington, are MAKERS of SULPHURIC ACID, from Brimstone, for Sulphate of Ammonia making. Highest percentage of Sulphate of Ammonia obtained from the use of this Vitriol. References given to Gas Companies.

SULPHURIC ACID.

HUGH WALLACE & CO., Chemical Manufacturers (the old-established firm), supply the above, which is specially adapted for making White Sulphate of Ammonia. The latter purchased in any quantities at highest market prices, or contracts for the year.
For price and terms apply Botolph House, Eastcheap, LONDON, E.C.

SULPHATE of Ammonia Lead Work and Fittings. Lead Burner. Tanks and Saturators made and repaired on the shortest notice.
Address P. J. DAVIES, 78, Earl's Court Road, Kensington, LONDON.

TAR and Liquor wanted.
BROTHERTON AND Co., Commercial Buildings, LEEDS.

TAR-WORKS working Foreman wanted for small Works in Scotland; experienced, pushing, steady, competent Man.
State Experience and Wages required to No. 65, Keith and Co., EDINBURGH.

WANTED, a good Working Manager, to take entire charge of and work a small Country Gas-Works. One Retort in Summer, and three in Winter. Must be thoroughly trustworthy, and have had previous experience. Wages, £1 per Week, with Cottage, Gas, Coal, and Garden free.
Address S. F. CORNISH, MOORGATE STREET CHAMBERS, E.C.

CARBONIZING Foreman wanted at a Gas-Works to take the Night Duty.
Apply (by letter) stating age and wages required, and enclosing references, to No. 1743, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, One small second-hand SCRUBBER, suitable for a Gentleman's private Gas-Works.
Address, stating price and other particulars, G. P. POOLE, Gas-Works, Sutton and Hooton, CHESHIRE.

CRUDE Ammonia or Gas-House Refuse. Offers wanted for Cash.
Apply to No. 1745, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

CAST-IRON Socket Pipes for Sale (about 600 yards of 6-inch, 500 yards of 4-inch, 3000 yards of 3-inch), a quantity of FITTINGS, and a few SLUICE-VALVES, all practically as good as new. Have been used for Water-Mains at the recent R.A.S.E. Show.
Apply for particulars to WELLMAN BROS. AND Co., WINDSOR.

ON SALE—3000 tons of Cannel put on Rail at 6s. 6d. per ton. Analysis as follows:—

Specific Gravity, Water as 1·000	1·260
Weight of 1 cubic foot	85·00
Yield of Gas per ton	8200
Illuminating Power	20·50
	cwt. qrs.
Coke unslacked per ton, inferior quality	15 1
Ammoniacal Liquor per ton	120 lbs.
Tar per ton	60 lbs.
Sulphur in Coal per ton	1·75
Volatile Matter	23·50
Fixed ,,	76·50
	100·00

Apply to T. FEATHER, Colliery Agent and Coal and Cannel Merchant, Mirfield, *vid* NORMANTON.

FOR SALE—Single Gasholder, 60 feet diameter by 23 feet deep. Capacity, 65,000 cubic feet; fixed complete; in good condition.
Also four PURIFIERS in a line, 14 ft. square by 4 ft. deep, with Centre-Valve and Connections, Wrought-Iron Covers, Lifting Gear, and Crab complete. Makers, Messrs. C. & W. Walker.
Also four PURIFIERS in a group, 16 ft. by 12 ft. by 3 ft. 9 in. deep; 12-inch Centre-Valve and Connections.
Would erect the above and make practically equal to new.
Inquiries invited for various second-hand Gas Plant—Gasholders, Tanks, Purifiers, Washers, Exhausters Station Meters, &c.
Apply to SAML. WHILE (late Ashmore and While), 60, Queen Victoria Street, LONDON, E.C.

CORPORATION OF LEICESTER.

SULPHURIC ACID.

THE Gas Committee of the above Corporation are prepared to receive TENDERS for the supply of SULPHURIC ACID made either from Native or Sicilian Brimstone, Recovered Sulphur or Pyrites. Specific gravity in each case to be stated.
The price to include free delivery by Rail into elevated Tanks (37 feet high) at the Chemical-Works, Aylestone Road Gas-Works.
Probable quantity, about 1200 tons, to be delivered as required during the Twelve months ending Aug. 31, 1890.
Tenders, addressed to Councillor Lennard, Chairman, and endorsed "Tender for Acid," to be delivered at these Offices not later than Eleven o'clock a.m. on Saturday, Sept. 7.
The Committee do not bind themselves to accept the lowest or any tender.

ALFRED COLSON, C.E.,
Engineer and Manager.
Gas Offices, Millstone Lane, Leicester,
Aug. 28, 1889.

SHREWSBURY GASLIGHT COMPANY.

SULPHURIC ACID.

THE Directors of the above Company invite TENDERS for the supply of SULPHURIC ACID (B.O.V.), 150° Twaddel, to be delivered by Road, Rail, or Canal, at the Company's Sulphate-Works, Shrewsbury, during Twelve months from the 29th of September, 1889.
The Acid to be free from Dirt; to produce clean white Sulphate; and to be delivered in Carboys at such times and in such quantities as may be required by the Company's Manager.
About 100 tons will be required under the contract.
Terms: Monthly, less 2½ per cent.
The Directors do not bind themselves to accept the lowest or any tender.
Tenders to be sent to the undersigned on or before Sept. 14, 1889.

By order,
WM. BELTON, Assoc. M. Inst. C.E.,
Secretary and Manager.
Gas-Works, Shrewsbury, Aug. 27, 1889.

TO TAR DISTILLERS.

THE Gas Committee of the Keighley Corporation invite TENDERS for the purchase of their TAR to the 1st of September next.
For particulars and form of tender, apply to the undersigned.
Tenders, endorsed "Tender for Tar," to be sent in to this Office, addressed to the Chairman of the Gas Committee, on or before Monday, the 16th inst.

By order,
JOHN LAYCOCK, Engineer, &c.
Gas Department, Low Bridge, Keighley.

CITY OF BELFAST.

CONTRACT FOR COAL.

THE Gas Commitee of the Belfast Corporation invite TENDERS for a supplementary supply of 30,000 tons of best screened GAS COAL, to be delivered at the Gas-Works Wharf, or free and trimmed in Barges at Belfast Harbour, between Nov. 1, 1889, and Oct. 31, 1890.
Monthly quantities and particulars may be obtained from the Manager of the Gas-Works.
Tenders, endorsed "Tender for Coal," should be delivered in my Office not later than the 18th of September.
The lowest or any tender not necessarily accepted.

SAMUEL BLACK, Town Clerk.
Town Hall, Belfast, Aug. 29, 1889.

TO TAR DISTILLERS AND OTHERS.

THE Directors of the Leamington Priors Gas Company invite TENDERS for the purchase of the surplus TAR produced at their Works (estimated at about 150,000 gallons per annum) for periods of One, Two, or Three years, dating from the 1st of October next.
Tenders to state price per 200 gallons delivered into Canal Boats alongside the Company's Works, and to be sent in not later than Friday, Sept. 20 next.
The Directors do not bind themselves to accept the highest or any tender.
Terms, monthly payments.

By order,
WILLIAM CROSS,
Secretary and Engineer.
Gas-Works, Leamington, Aug. 23, 1889.

COUNTY BOROUGH OF SALFORD.

(GAS DEPARTMENT.)

OXIDE OF IRON.

THE Gas Committee are prepared to receive TENDERS for the supply of 350 tons of OXIDE OF IRON for purifying the Gas at their Works.
Forms o tender and further particulars may be obtaine on application to the Gas Engineer, Gas Offices, Bloom Street, Salford.
Seal tenders, endorsed "Tender for Oxide of Iron," and addressed to the Chairman of the Gas Committee, must be delivered to me not later than Thursday, the 5th of September, at Five o'clock p.m.

By order,
SAM. BROWN, Town Clerk.
Town Hall, Salford, Aug. 24, 1889.

COLNE AND MARSDEN LOCAL BOARD.

GAS COAL CONTRACT.

THE Gas Committee of the above Board invite TENDERS for the supply of good screened GAS COAL for their Works, delivered at Colne Station in such quantities as their Manager directs, for One or Two years from Oct. 1, 1889.
Probable quantity, about 6000 tons per year.
The Coal to be of good quality, and free from all refuse.
Tenders to be endorsed "Tender for Coal," and addressed to the Chairman of the Gas Committee, on or before Sept. 9, 1889.
The Committee do not bind themselves to accept the lowest or any tender.

THOMAS VARLEY.
Colne, Aug. 22, 1889.

C. & W. WALKER.

GASHOLDERS; PURIFIERS; PURIFYING MACHINES;

CO_2 AND TAR-EXTRACTING WASHERS; SCRUBBERS;

SULPHATE & SULPHUR PLANT;

RETORT MOUTHPIECES; CONDENSERS;

LIFTING APPARATUS; CENTRE AND FOUR-WAY VALVES;

SLIDE VALVES; TAR BURNERS; &C., &C.

WOOD SIEVES.

ADDRESSES:

8, Finsbury Circus, London, E.C.; Midland Works, Donnington, Salop.

"FORTRESS LONDON." "FORTRESS DONNINGTON."—Telegraphic.

BOROUGH OF DONCASTER.

THE Gas Committee of the Borough of Doncaster have about 60 tons of SPENT OXIDE FOR SALE. Originally Nicholson's Precipitated; now 48 to 50 per cent. Sulphur.

Offers, at a Price per Unit free on Rails, Doncaster, will be received by the undersigned.

The highest or any offer not necessarily accepted.

RT. BRIDGE,
Engineer and Manager.

Aug. 27, 1889.

Price 2s. per dozen, or 10s 6d. per 100, post free.

CONSPIRACY and Protection of Property Act. It is required, under a Penalty of FIVE POUNDS, that a Printed Copy of the 4th Section of this Act shall be posted up at all Gas-Works, in a conspicuous place, where the same may be conveniently read by the persons employed thereat.

Printed copies of this Section, in large type, on broad sheets, may be obtained of WALTER KING, 11, Bolt Court, FLEET STREET, E.C.

** *The Act extends to Scotland and Ireland.*

TO INVENTORS AND PATENTEES.

MR. W. H. BENNETT having had considerable experience in matters connected with Gas, Water, and Sanitary Improvement, begs to say that he continues to assist Inventors in the perfection of their designs, and to obtain for them PROVISIONAL PROTECTION, whereby their Inventions may be secured for Twelve months; or LETTERS PATENT, which are granted for Fourteen Years.

Patents completed, or proceeded with at any stage, thereby rendering it unnecessary for persons resident in the country to visit London.

Patents procured for Foreign Countries.

Information as to cost, &c., supplied gratuitously upon application to the Advertiser, 22, Great George Street, WESTMINSTER.

GEO. E. TOURNAY,
Retort-Setter,
Contractor for the Erection of Retort-Ovens, Chimney Shafts, &c.,
THANNINGTON, CANTERBURY.

ROBERT MARSHALL,
CANNEL COAL MERCHANT,
97, WELLINGTON STREET, GLASGOW.

Prices and Analysis of all the Scotch Cannels on application.

ESTABLISHED 1869.
HYDRATED OXIDE OF IRON
(BOG ORE).
Trimest Cleanest Quality. Stock kept at MINES for direct Shipments to any Port, also at Garston Docks.
GEO. G. BLACKWELL,
25, 26, & 27, Irwell Chambers, W. Liverpool.

GEORGE McKAIG,
MANUFACTURER OF **WOOD GRIDS** FOR GAS PURIFIERS,
36, Cleveland Street, DONCASTER.

TAR AND LIQUOR PURCHASED
JOHN CLARKSON MAJOR,
(*Established 1851,*)
Tar Distiller and Manufacturing Chemist,
WOLVERHAMPTON.
BRANCH WORKS:—
SCULCOATS, HULL.

COKE BREAKERS,
FROM £14 EACH.
(THOMAS & SOMERVILLE'S PATENT.)
New Design, with two Cutting Rollers, making less Breeze than their old pattern.
GEORGE WALLER & CO.,
PARK STREET, SOUTHWARK, S.E.

THOMAS ILLINGWORTH,
NORTH DEAN CHEMICAL WORKS,
Near HALIFAX,
MANUFACTURER OF SULPHURIC ACID
OF EXTRA QUALITY FOR MAKING
WHITE SULPHATE OF AMMONIA.

TAR, LIQUOR, AND SPENT OXIDE
Purchased for Cash against Delivery.

THE ONLY RELIABLE
DRY CENTRE-VALVE.
WORKING ONE, TWO, THREE, OR FOUR PURIFIERS ON AT THE TIME.
ALSO MADE FOR TWO OR THREE PURIFIERS.
No Springing. No Leakage. No Foul Gas passed in Changing. Special Facility for Blowing the Air out of the Fresh Box before putting in Action, without driving it forward into the Holders.
Write for Prospectus.
ALSO DOUBLE-ACTION DOUBLE-FACED GAS & WATER VALVES.
F. WECK, 86, NEW STREET, BIRMINGHAM.

To effect a great saving in
GAS-FURNACES use our
Special Derbyshire GANNISTER BRICKS.
ADDRESS
JAMES WHITE & Co.,
ALBERT WORKS, WIDNES.

UNEQUALLED.
Gas Companies are solicited to try Samples of the
MIRFIELD
BLACK BED GAS COAL.
Prices and Analysis on application.
MIRFIELD (GAS-COAL) COLLIERY COMPY.
MIRFIELD, NORMANTON.

IMPROVED RETORT SETTING.
W. G. WALLER & Co.,
RETORT SETTERS & CONTRACTORS,
Having had much experience in the Setting of Retorts, beg to call the attention of Gas Engineers and Managers to their Improved System of Setting Retorts and Tar-Furnaces.
Contractors for Building Shafts, Tanks, Retort Benches, and all other Buildings connected with Gas-Works.
Estimates on application.
The Poplars, Waddon, Croydon, Surrey.

ARMSTRONG'S
PATENT
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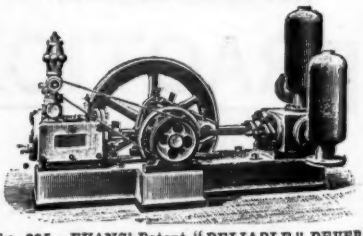
Fig. 685.—EVANS' Patent "RELIABLE" REVERSIBLE TAR and LIQUOR PUMP.
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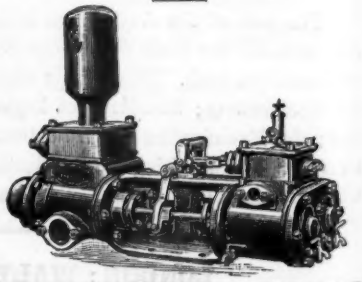
Fig. 670.—DUPLEX PUMP FOR GENERAL PURPOSES.

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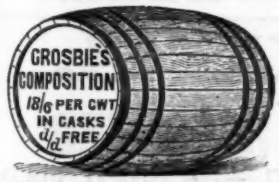

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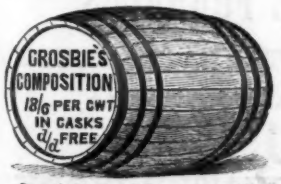

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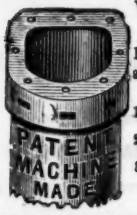

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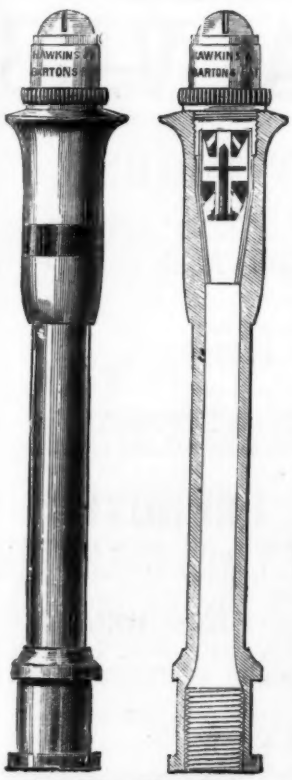

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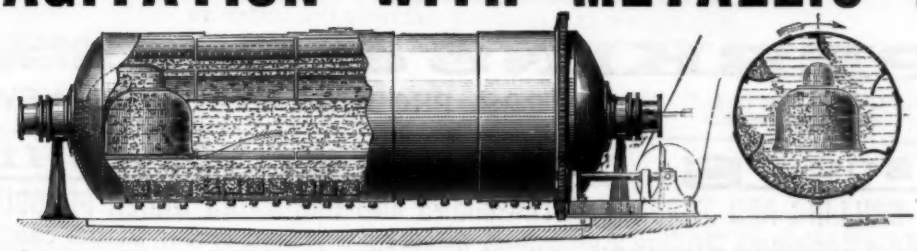

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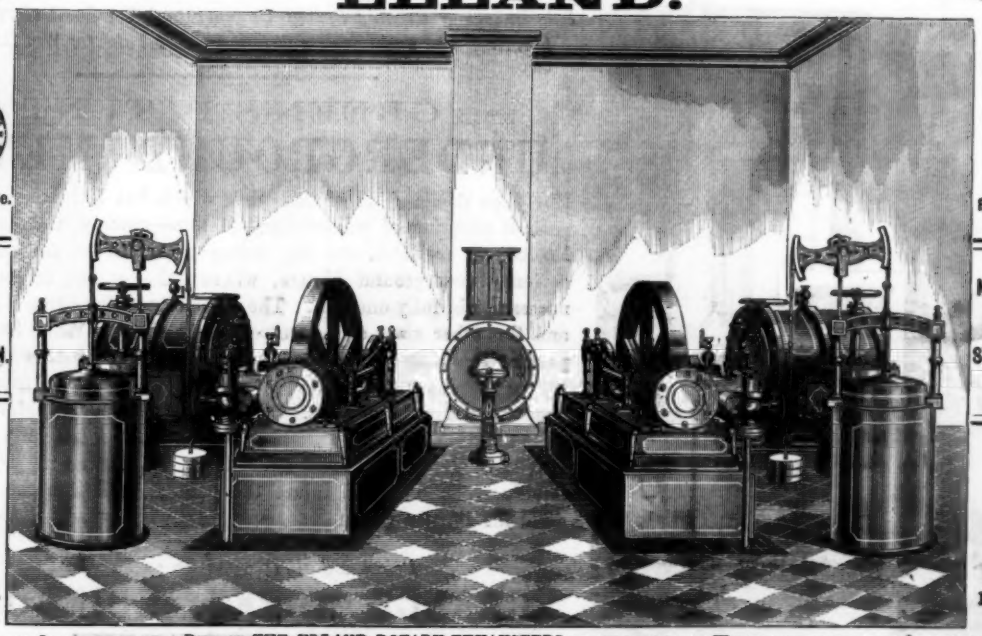

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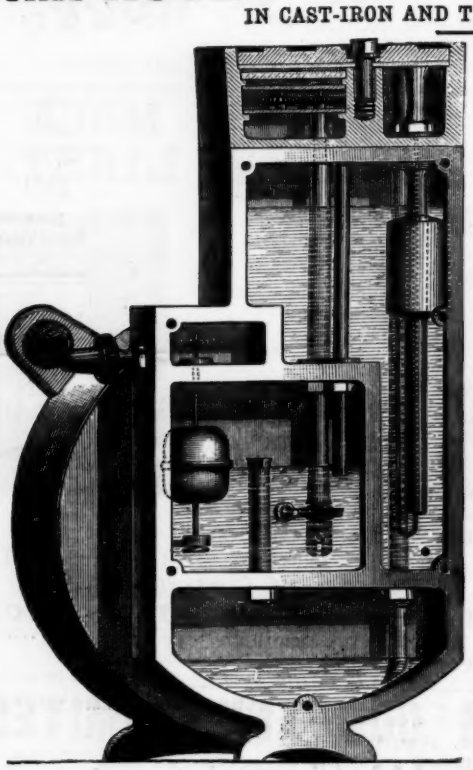

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MOST ECONOMICAL, SIMPLE, AND DURABLE.
DOES NOT GET OUT OF ORDER.
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FOR
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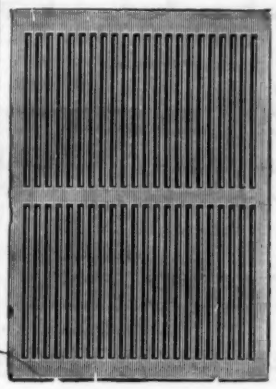

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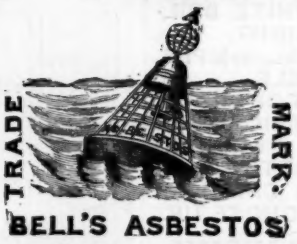
BELL'S ASBESTOS AQUOL PAINT



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IS IMPERVIOUS TO HEAT, COLD, OR WATER.
IS WITHOUT SMELL.

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For Outside or Inside Work in any Climate.

Bell's Asbestos Aquol Paint is equally suitable for the finest decorative work as well as for general painting. It can be applied over or under any other paint, and, owing to its easy application, can be used with a large distemper brush; the SAVING THUS EFFECTED IN LABOUR BEING **50** PER CENT. OVER THAT OF LEAD PAINTS.

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Suitable for Ceilings, Walls, and New Wood, and is very durable.

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Owing to its Covering Capacity, a SAVING IN FREIGHT of 40 per cent. is effected for a given surface.

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GLASGOW: 35, Robertson Street. DUBLIN: 2, St. Andrew Street. BERLIN and BARCELONA.

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ROUND.

SQUARE. Every 10 feet has Label as above, and bears our Trade Mark.

Under this registered title are included the inventions of Mr. Field; and experience has proved them to be the MOST EFFICIENT DURABLE, and ECONOMICAL PACKINGS ever made. They constitute such a combination of Asbestos and India-rubber as secures the maximum of elasticity and heat resistance; and they are, therefore, UNEQUALLED FOR EVERY KIND OF ENGINE. These Packings are being universally used by most of the leading Steamship Companies throughout the world for ordinary Compound, Triple, and Quadruple Expansion Engines of the latest types. The packings are composed of rolled Asbestos Cloth, but the India-rubber is placed in two forms to suit various cases.

IN ORDERING STATE WHETHER SQUARE OR ROUND IS REQUIRED.

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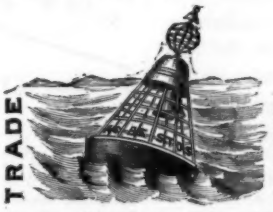

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Is specially suited for
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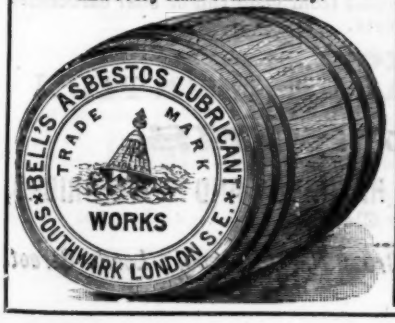
Is unequalled
For Steam-Engines & Cylinders, Gas-Engines, and every class of machinery.



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The reputation of this Lubricant is based on the experience of thousands of users, which places it far in advance of those who rely only on mere laboratory tests.

ASBESTOLINE IS THE CHEAPEST, MOST EFFICIENT, CLEANEST, MOST INODOROUS AND SAFEST LUBRICANT.

ASBESTOLINE HAS SAVED 90 PER CENT. OVER OIL.

Has been used for all purposes, AND BEATEN ALL OTHER LUBRICANTS IN ACTUAL WORK.

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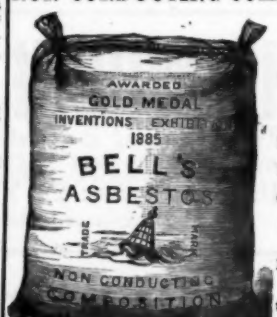
EXPANSION SHEETING

RINGS AND TAPE.

The above Sheeting, which can only be obtained from this House, is recognized as the most efficient and economical jointing material in use.

Is the most efficient and reliable material for Manhole, Mudhole, Steam-Pipe, and all other joints.

BELL'S ASBESTOS
NON-CONDUCTING COMPOSITION.



Will reduce loss by radiation, and saves 40 per cent. of fuel.

Is suitable for boilers with flat or round bottoms. Is superior to any other, and saves its cost in a few months.

Is sent out dry in bags; therefore cheaper than others sent out wet.

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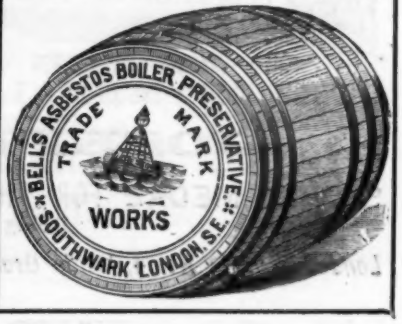
Will effectually keep Boilers clean, and remove any Incrustation, without injury to the Boiler, Plates, or Fittings.



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Cast and Wrought Iron Tanks, Purifiers, Condensers, Scrubbers, Retort-Lids, Cross-Bars and Screws, Wrought-Iron Boilers for Stationary, Portable, and Marine Engines, Sugar Pans, Coolers, Clarifiers, Punts, Boats, Bridges, Girders, Roofs, Cisterns, Oil-Tanks, Melting-Pots, Crucibles, Salt-Pans, Arch and Range Boilers, and every description of General Ironwork.

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Improved Self-acting AND *Steam Liming Process*

Under pressure, effecting a considerable Saving in Time in Working off the Contents of each Still.

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A number of Plants on the Open System recently remodelled with greatly improved results.

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MESSRS. ABBOT & Co. (Works at Gateshead-on-Tyne) employ 2000 men, including several experienced Plumbers, to erect New and remodel Old Sulphate Plants.

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To suit all sized sections of Retort. Over 70 stock sizes. Largely used in England.

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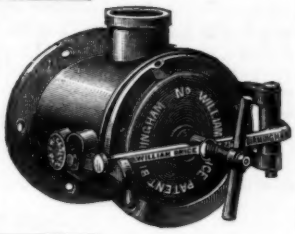
Made to suit large or small Gas-Works. The one machine draws the spent coke and recharges the Retort at one operation. Self-contained; working from engine on base or by hand. Price and particulars on application.



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Machine-Moulded Spur, Bevel, Mitre, and Helical Wheels and Pulleys, to 20 feet diameter.

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As supplied to the English Railway Companies.

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Of all Kinds.

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SULPHATE OF AMMONIA.

By Her Majesty's Royal Letters Patent.

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The most successful and approved Apparatus known up to the present time.

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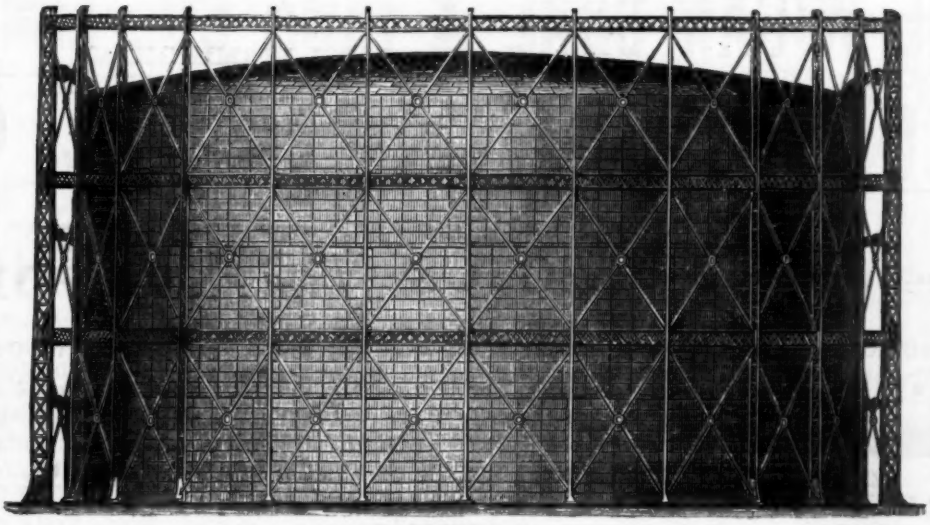
GASHOLDERS of Improved Construction.



Tar, Sulphate, Muriate, and Liquid Ammonia Plants.

MAKERS OF

IMPROVED CONDENSERS, SCRUBBERS, AND WASHERS;

PURIFIERS with PLANED JOINTS; CENTRE-VALVES TO WORK ALL FOUR PURIFIERS; EXHAUSTERS;

AND ALL APPARATUS and FITTINGS used in GAS MANUFACTURE.

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MANUFACTURERS OF

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FOR

CHARGING AND DRAWING GAS-RETORTS.

OVER **160** MACHINES AT WORK AND IN COURSE OF CONSTRUCTION.

ADVANTAGES ATTENDING ITS USE ARE:—

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REDUCTION in LABOUR and COST of WORKING.—In Works where this System of charging and drawing Retorts is adopted, there has been effected a substantial saving in the cost of Gas Manufacture in the Retort-House; the amount saved varying in different Gas-Works from 8 PENCE to 15 PENCE per Ton of coal carbonized. Full particulars will be forwarded upon application to W. G. I. Company, Limited.

MANUAL CHARGING AND DRAWING MACHINES.

POWER CHARGING AND DRAWING MACHINES, driven by Wire Rope, Steam, or Compressed Air.—The power machines are applicable to circular, oval, or Ω-shaped retorts and mouthpieces, and are the most perfect, economical, efficient, and durable machines made; they are constructed on principles founded by long and extensive experience in this special branch of gas engineering and the manufacture of gas.

Sole Makers of CIRCULAR, OVAL, or Ω-shaped MOUTHPIECES, with Morton's Self-Sealing Lids, fitted with

KING'S PATENT FASTENINGS,

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N.B.—The whole of these Fittings are made of Wrought Iron.

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A SPECIAL COMPOUND

FOR THE CURE OF STOPPED ASCENSION-PIPES,

A couple of charges of which will clear a stopped pipe, and an occasional charge keeps them clean, and also increases the make per ton and the illuminating power.

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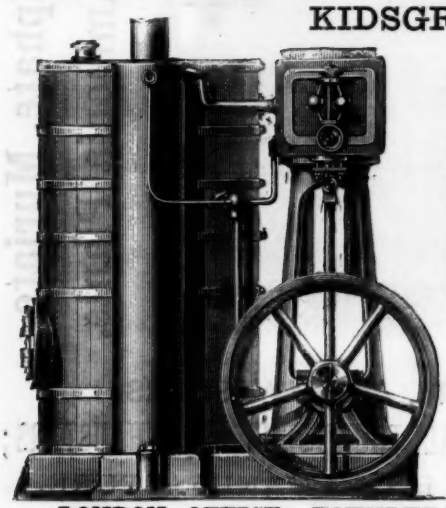

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PRIME MOVER, suitable for Tram Cars, Yachts, Hoists, Dynamos, Pumps, and Driving Machinery in Gold Mining, Crushing, Grinding, Cutting, Printing, Ventilating, Farming, &c., &c.

ADVANTAGES: Cost of Fuel ONE FARTHING per hour per horse power. 50 PER CENT. less than Gas-Engines. Absolute safety. Entirely Automatic. Only attention required being for fire at long intervals.

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